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# PROCEEDINGS

of the

## American Society

of

## Civil Engineers

INSTITUTED 1852

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VOL. 54

SEPTEMBER, 1928

No. 7

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# PROCEEDINGS

## SOCIETY AFFAIRS

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and that (1) such basic and fundamental technical information and knowledge as may be required for the practice of the profession, (2)

## AMERICAN SOCIETY OF CIVIL ENGINEERS

is the primary and principal object of the American Society of Civil Engineers.

## PROCEEDINGS

VOL. 54

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### SOCIETY AFFAIRS

#### REPORT OF THE TECHNICAL EXPANSION COMMITTEE

At the meeting of the Board of Direction on January 19, 1928, the Technical Expansion Committee was appointed in order to encourage more of the members to become familiar with the work and the possibilities of the various Technical Divisions. This Committee has made a thorough study of many things and has submitted the following report. In addition to the names appearing at the end of the report, the Committee includes Messrs. C. H. Paul and M. S. Ketchum, who have taken an active part. They were unavoidably absent at the last meeting when the report was signed.

July 16, 1928.

TO THE BOARD OF DIRECTION,  
AMERICAN SOCIETY OF CIVIL ENGINEERS:

GENTLEMEN.—As the duty of the Committee on Technical Expansion is understood, it is "to study and report on the present organization and conduct of the technical activities of the Society" and "to draft and recommend a proposed plan of organization through which to stimulate, supervise, and co-ordinate all the technical activities of the Society"; "special attention to be devoted to strengthening the work of the Technical Divisions".

Specifically: Publications, Technical Meetings, Research, Special Committees, Joint Technical Activities with other Societies, Technical Divisions, and other technical activities, were mentioned in the Committee's instructions. All of these are being given careful thought, but at this time only certain recommendations are definitely formulated.

of basic subjects on technological training

of study techniques of application and the

use of modern methods of application

and the development of educational and

research methods and to maintain and

encourage continuing and significant addi-

tional research to serve the profession

and the public welfare and to keep the

public informed of the results of the

work of the Society and to stimulate

and encourage interest in the work of the

Society and to develop a spirit of co-operation

and a sense of responsibility among the

members of the Society and to develop a

spirit of cooperation among the members

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#### General

The Society will be alert only as its members participate actively in Society work. So far as these activities are technical, they should be carried on primarily through Technical Divisions.

The ideal, therefore, is that there be Divisions, and that in each Division there be committees, each committee working on some subject of interest to it. Many of these subjects may be, and preferably should be, not highly theoretical. Each committee should have as its objective the presentation of a report to the members of the Division. Such report, having been printed previously in *Proceedings* in tentative form, should be featured at a Technical Division meeting in abstracted form. Every endeavor should be made to develop wide discussion and members of the Committee should be present to defend their points of view. After discussion a vote should be taken on whether the report is to be returned to the Committee for modification, or to be forwarded through the Executive Committee of the Division to the Board of Direction for adoption. The report when adopted should appear as a separate publication of the Society. These separate publications should be appro-

priately designated as a series issued by the Society.

If the principle is accepted that the technical activities of the Society are to be carried on as far as possible through the medium of the Technical Divisions, then meetings and publications must be considered in terms of the results developed by these Divisions through their committees. The character of the publications ultimately will be largely dependent upon the results obtained within the Division. The publications will undergo a gradual change until they assume this new character.

Until the Division committees are obtaining results, the publications may be so revised as to effect a saving in cost which may be applied to the work of Division Committees.

### Publications

Ultimately, it seems to your Committee, there will be three types of publications: *Transactions*, *Proceedings*, and a Series of Separates as produced by the Divisions. The following policies to be followed in the matter of publications are recommended:

#### Transactions

(1) The *Transactions*, the archives for the technical activities of the Society, shall contain only essential facts concerning the development of the art and science of Engineering of admittedly permanent value.

(2) Each statement shall be condensed to the fewest words and shall be accompanied by the least number of minimum sized illustrations practicable.

(3) Type printing, tables, and illustrations (photographs and diagrams) shall be the methods of expression, but to avoid duplication, the same matter shall not be stated by more than one of these methods.

(4) Display or expanded type setting shall not be used.

(5) Memoirs shall not appear in *Transactions*.

#### Proceedings

(1) The *Proceedings*, the forum of the Society, in its more formal part (Part I), shall contain material classified under three headings:

(a) Society affairs (including the Preliminary Lists).

(b) Technical matters (reports, papers, and discussions).

(c) Memoirs.

The informal part (Part II) shall contain non-technical matter.

(2) A section of the *Proceedings* should be set aside for the publication of worthy communications by Junior members on engineering subjects not of sufficient importance to justify treatment as papers.

(3) The material accepted for publication in *Proceedings* shall be edited for content and style as previously recommended for *Transactions*.

#### Separates

(1) The work of the Technical Divisions, as crystallized in reports, shall be published as separates in pamphlet form and as a series.

(2) Each separate shall be rigidly edited as to form and style.

(3) Each separate shall have the approval of the Division and of the Board of Direction of the Society, or its authorized Committee, before publication as a separate.

#### Material to Be Published

There is need for a revised understanding as to the character of material to be published, and it is recommended that as a step in this direction the invitation for papers as it appears in the Year Book should be changed to read as follows:

"The Society welcomes papers and discussions on engineering subjects for publication in *Proceedings*, reserving, however, the right to reject in whole or in part and to edit under the guidance of the Committee on Meetings and Publications. Material readily found elsewhere, merely amplifying existing information, advocating personal interests, carelessly prepared, controverting established facts or purely speculative or foreign to the purposes of the Society, will not be accepted."

"All papers upon acceptance by the Committee on Meetings and Publications become the property of the Society."

#### Meetings

The growth of the Technical Divisions and the sessions at the Quarterly Meetings render unnecessary the monthly meetings of the Society in New York for the presentation of papers.

It is, therefore, recommended that the regular meetings held at the Headquarters of the Society, except the two mentioned in the Constitution for the purpose of counting ballots on Constitutional amendments in March and October, shall be discontinued.

If this recommendation is adopted the following amendment to the By-Laws of the Society is recommended, of which the required notice is hereby given:

**Article VI.—Meetings, Paragraph 1.**

Amend Article VI, Meetings, Paragraph 1, by changing the first sentence, which reads:

"Business meetings of the Society shall be held monthly except during the months of July and August" to read as follows:

"Regular business meetings of the Society shall be held in March and October", making the amended paragraph read as follows:

**"Article VI.—Meetings**

"1.—Regular business meetings of the Society shall be held in March and October. In addition to the Annual Meeting and the Annual Convention, meetings for the reading and discussion of papers shall be held as ordered by the Board of Direction."

**Division Organization**

The work of the Technical Divisions may be more effectively and consistently carried out by establishing greater permanence in the personnel of the Technical Division Executive Committees.

All activities of the Society being under the control of the Board of Direction and for the purpose of saving time and money, it is recommended that the Board of Direction advise each Technical Division Executive Committee that the formality of taking ballots of the Division members should be dispensed with and that the change in the Constitution shall become effective upon favorable majority action of the Executive Committee of each Division.

It is recommended, therefore, that such change in Division Constitutions be made at the earliest possible moment. In carrying out this change the following amendment to the Constitution of each Technical Division is recommended:

**"Article VI.—Executive Committee**

"1.—The general direction of the affairs of the ..... Division shall be vested in an Executive Committee of five Division Corporate Members of the Society. The members of the Committee chosen in January, 1928, shall determine by lot their terms of office; one to serve for one year, one for two years, one for three years, one for four years, and one for five years. Thereafter one member

of the Executive Committee shall be elected annually for a term of five years.

"2.—Nominations for the Executive Committee shall be made by a Nominating Committee of five Division members, appointed by the Executive Committee during July of each year. The report of the Nominating Committee shall be made to the Secretary of the Society not later than October 1st, and shall be mailed to all members of the Division not later than November 1st. The Nominating Committee shall report, as nominees for the office to be filled, the names of three members of the Division who are also Corporate Members of the Society and who have expressed their willingness to accept such nomination. Additional nominations may be made by declaration, provided such declaration is accompanied by the acceptance of the nominee and is filed with the Secretary before November 20th, and further provided that such declaration is signed by at least ten members of the Division and shall be designated as 'Nominations by Declaration'.

"3.—Election to the Executive Committee shall be by letter-ballot, to be prepared and sent out by the Secretary of the Society to all members of the Division on December 15th, or if that day falls on a holiday or Sunday, not later than December 17th. The ballot shall include the name, residence, and grade of membership of each person nominated. 'Nominations by Declaration' shall be distinguished from 'Official Nominations' by some convenient mark or words. Voters may strike out the names of nominees printed on the ballot for whom they do not wish to vote, and may substitute therefor, by writing on the ballot, the name of any person eligible for the office. Ballots not complying with these rules shall be rejected. Instructions in accordance with these provisions shall be issued with the ballot.

"Ballots shall be sent by mail to the Secretary, or presented to him at Society Headquarters. Each ballot shall be enclosed in a plain envelope which shall be sealed and placed in an outer envelope endorsed with the voter's signature. The polls shall be closed at 9 A. M. on the Monday two weeks prior to the Annual Meeting of the Society. Ballots shall be canvassed by a committee appointed by the President of the Society. The person receiving the largest number of votes for each office shall be declared elected and the result of the election shall be promptly transmitted to the Secretary of the Division. In case of a tie vote, the

election shall be decided on the basis of seniority of Corporate Membership in the Society.

"4.—The incoming Executive Committee shall assume office at the close of the Division meeting held in connection with the Annual Meeting of the Society, or, if there is no Division meeting, at the close of the Annual Meeting of the Society.

"5.—Should a vacancy occur in the Executive Committee, it shall be filled by vote of the remaining members.

"6.—A quorum of the Executive Committee shall consist of two members and the Division Secretary. Questions may be decided by letter-ballot of the entire membership of the Committee."

If the recommendation is adopted for greater continuity of personnel of Division Executive Committees, the following amendment to the By-Laws of the Society is recommended, of which the required notice is hereby given:

**Article VII.—Technical Divisions.—  
Paragraph 3**

Amend Article VII, Paragraph 3, by omitting the word, "annually," from the first sentence, making the amended sentence read:

"The Division shall elect an Executive Committee of five members of the Division who shall be Corporate Members of the American Society of Civil Engineers, to have charge of its affairs under the guidance of the Board."

This report is respectfully submitted:  
GEORGE W. FULLER, Chairman,  
LINCOLN BUSH,  
H. W. DENNIS,  
RICHARD L. HUMPHREY,  
GEORGE T. SEABURY,

*Committee on Technical Expansion.*

**FREEMAN SCHOLARSHIPS**

The Freeman Scholars who left the United States last July have now completed a year of valuable study in the hydraulic laboratories of Europe. To gauge the extent of their work and the breadth of their experience one need only read the several items concerning them that have been written in various publications during the year.

Of the Civil Engineering group, Lorenz G. Straub and Morrough P. O'Brien, Juniors, Am. Soc. C. E., were to have stayed in Europe for one more year. However, Mr. O'Brien has decided to go to the University of California next year as Assistant Professor, and the third member, F. Theodore Mavis, Assoc. M.

Am. Soc. C. E., had previously accepted a similar position at Iowa State College.

This leaves one vacancy for "an American citizen, not less than 24 nor more than 35 years of age, who is a graduate of a technical school of recognized standing and is now a junior professor, an instructor or an assistant in a technical school in which hydraulics is an important part of the curriculum." The Secretary will be happy to correspond with prospective applicants to explain all the conditions in detail. Applications will be closed September 10 and candidates selected not later than September 15.

**AMERICAN ENGINEERING  
COUNCIL**

As a result of recent action (July, 1928) by the Board of Direction, expressing itself in favor of affiliation with the American Engineering Council, the membership of the Society will soon be asked to vote on the question outlined in the following resolution:

"Whereas, the engineers of the United States are becoming more conversant with the mutual problems of their profession and of the services which they can render to their fellows and the public, which objective can more readily be obtained through joint action and

"Whereas, the American Society of Civil Engineers desires to contribute to the welfare of its members and the public, and

"Whereas, the Constitution, By-laws, and other affairs of the American Engineering Council have been thoroughly studied by a special committee of this Board and by a Joint Conference Committee of the Founder Societies and others, and are now in process of revision in such a way that this Board can fully approve. Therefore be it

*Resolved:* That the Board of Direction of the American Society of Civil Engineers assembled this 16th day of July, 1928, expresses its judgment that the Society shall affiliate with the American Engineering Council and that confirmation of this be sought through a referendum vote by the membership authorizing the Board of Direction to join Engineering Council at such time as the revisions proposed are adopted."

In order to help the membership to appraise the general situation, the Board decided to appoint a committee to prepare an outline of the most important facts and any other items of interest bearing on this subject. This informa-

tion will accompany the referendum ballot. The members appointed are Messrs. C. H. Paul, A. J. Hammond, and J. C. Hoyt.

### PRIZES TO MEMBERS OF STUDENT CHAPTERS

Following the usual custom, several Local Sections have awarded prizes to members of Student Chapters for papers of outstanding excellence. The prize awarded includes the entrance fee and, in some cases, one year's dues as a Junior member in the Society. A list of the prize winners follows:

state of flux. What was considered leading practice a few years ago may be obsolete now. Sometimes before a book on a particular specialty can be written and published, the material of the book is out of date. Obviously, books are relatively less important, and periodicals relatively more important, in engineering than in most other learned professions. This is borne out by the enormous number of periodicals (more than 1200) regularly received at the Engineering Societies Library. Few individuals subscribe to 1% of that number. Not many engineers, in fact, take more than one, or possibly two, technical periodicals.

Name.	College.	Local Section.
Carleton H. Lewis.....	State University of Iowa.....	Iowa
James M. Marrett.....	North Carolina State College.....	North Carolina
Irvin Frazier.....	University of Colorado.....	Colorado
Walter Howe.....	Antioch College.....	Dayton (Ohio)
Thomas Scheibe.....	Antioch College.....	Dayton (Ohio)
Joe D. Denise.....	University of Dayton.....	Dayton (Ohio)
Joseph H. Walter.....	University of Dayton.....	Pittsburgh (Pa.)
Warren M. S. Riley.....	University of Pittsburgh.....	Pittsburgh (Pa.)
Lewis A. Evans.....	Carnegie Institute of Technology.....	San Francisco
Harner E. Davis.....	University of California.....	San Francisco
William J. Travers, Jr.....	Leland Stanford University.....	Kansas State
William S. Reeder.....	Kansas State Agricultural College.....	Kansas State
Loring O. Hanson.....	University of Kansas.....	Philadelphia
Thomas L. McNeé.....	Villanova College.....	Philadelphia
Alfred T. Waidelich.....	Drexel Institute.....	Illinois
William W. Kerr, Jr.....	Armour Institute of Technology.....	Illinois
Willard A. Anderson.....	Armour Institute of Technology.....	Illinois
James E. Goddard.....	Rose Polytechnic Institute.....	Illinois
Charles R. Little.....	Purdue University.....	Illinois
Edwin O. Williams.....	Northwestern University.....	Illinois
Merrill B. Garnet.....	Northwestern University.....	Illinois
James S. Massey.....	Virginia Polytechnic Institute.....	Virginia
J. B. Ecker.....	Washington and Lee University.....	Virginia
Arthur A. De Fraites.....	Tulane University.....	Louisiana
Stewart E. Worley.....	Louisiana State University.....	Louisiana
David E. Spathel, Jr.....	Washington University.....	St. Louis
Kenneth T. Case.....	Oregon State Agricultural College.....	Portland (Ore.)
George M. Thayer.....	Oregon State Agricultural College.....	Portland (Ore.)
Gustaf E. Bjork.....	University of Idaho.....	Spokane
Frank H. Behnhauer.....	University of Illinois.....	Central Illinois
William L. Collins.....	University of Illinois.....	Central Illinois

Most of these thirty-one men have already submitted their application for membership.

### A GREAT STOREHOUSE OF ENGINEERING INFORMATION\*

#### Periodical Literature

In a profession so vigorously youthful as engineering, particular attention to periodical literature is necessary. Engineering technology is continually in a

When so much is being published, how can an individual engineer keep abreast of it? Partly by abstracts and indexes, it is true, and partly by alert skimming, but to keep in touch properly with one's specialty in periodical literature is becoming more and more of a problem.

The staff of the Engineering Societies Library has developed a service for informing an individual or corporation of published articles on any assigned subject. This is called card service. It costs \$10 per year plus 5 cents for each card sent.

\* This is the ninth of a series of articles for the information of the membership of the work on Engineering Societies Library. The first eight items were published in November and December, 1927, and in January, February, March, April, May, and August, 1928, *Proceedings*.

Forty-three subscribers received 6768 cards during 1926. Many of these were research departments of engineering corporations that wished to utilize every suggestion and clue available for the particular specialty in which they were experimenting. Such information is cheap at any price. A single suggestion from an obscure periodical may save thousands of dollars in experimentation.

One subscriber to the card service is Road Commissioner for an important State. He wants to know of all articles on the construction and upkeep of roads. For him to subscribe to all the periodicals in the world publishing articles on roads, and then to examine them as they came in, would be an expensive undertaking. The Library does this for him. Of the 300 cards or more received yearly, he may want to look up twenty articles. If any of these are not easily available, he asks the Library to send him photo-prints of them at 25 cents per print. The Library makes any necessary translations of foreign articles at moderate rates. The service is thus complete. Selected periodical information is made available and readable.

#### APPOINTMENTS OF SOCIETY REPRESENTATIVES

The following members have been appointed to represent the Society in various capacities:

Society Representative and Alternate on Sectional Committee for Brick Masonry Work of the American Engineering Standards Committee: J. S. Langthorn and George L. Lucas, Members, Am. Soc. C. E.

The John Fritz Medal Board of Award: Lincoln Bush, President, Am. Soc. C. E.

Society Representative on the Division of Engineering and Industrial Research of the National Research Council, June, 1928 to June, 1931: Charles M. Upham, M. Am. Soc. C. E.

Society Representative on Committee of the American Institute of Mining and Metallurgical Engineers, Relative to Re-

search on the Alloys of Iron: J. A. L. Waddell, M. Am. Soc. C. E.

Society Representative on Advisory Committee of the Art Center of New York City on Wayside Refreshment-Stand Campaign: Warren J. Scott, Assoc. M. Am. Soc. C. E.

Society Representatives on Committee on American Marine Standards (U. S. Bureau of Standards): Harry A. Seran and A. M. Sobieralski, Members, Am. Soc. C. E.

#### A REDUCTION IN DUES

All members of the Power Division will be interested in the action taken at the Buffalo meeting to relieve them of the extra assessment of \$1.00 per year for dues. This Division was one of the first four organized under authority given by the Board of Direction June 20, 1922. Furthermore, it is the only one that has exacted dues of its members; now, membership in all nine Technical Divisions will be free to members of the Society. This is as it should be. The Technical Divisions are not separate entities, but simply segregations of the membership into units for the more logical and more effective accomplishment of the work of the Society.

#### INTERNATIONAL CONGRESS FOR BRIDGE AND STRUCTURAL ENGINEERING

Beginning September 24 of this year, the Second International Congress for Bridge and Structural Engineers will be held at Vienna, Austria. The First International Congress was held in Zurich, Switzerland, in 1926. In connection with this year's session, an Honorary Committee has been named to include the respective Presidents of the foremost Civil Engineering Societies of Europe and America. President Lincoln Bush was invited to represent the Society, but owing to the stress of Society business he will not be able to attend.

## Report of Tellers on First Ballot for Official Nominees

"August 1, 1928.

"To the SECRETARY,

AMERICAN SOCIETY OF CIVIL ENGINEERS:

"The Tellers appointed to canvass the First Ballot for Official Nominees report as follows:

"Total number of ballots received..... 993

"Deduct:

Ballots from members in arrears of dues.....	33
" " " voting from wrong district.....	1
" " " non-members .....	2
" without signature.....	2

"Total not entitled to vote..... 38

"Ballots canvassed..... 955

"For Vice-President, Zone II: "For Vice-President, Zone III:

Arthur James Dyer..... 151	John Venable Hanna..... 119
Charles Carroll Brown..... 17	Alonzo John Hammond..... 110
Herbert Drummond Mendenhall 16	Charles Howard Paul..... 47
Scattering ..... 104	George Harrison Fenkell..... 38
Blank ..... 12	T. Chalkley Hatton..... 24
Void ..... 0	Scattering ..... 135
Total ..... 300	Blank ..... 30
	Void ..... 2

"For Director, District No. 3: "Total ..... 505

George Harvey Norton..... 80	"For Director, District No. 8: "Total ..... 98
Scattering ..... 27	Albert Ferdinand Reichmann..... 24
Blank ..... 1	Blank ..... 3
Void ..... 0	Void ..... 0
Total ..... 108	

"For Director, District No. 5: "Total ..... 125

Frank Lee Nicholson..... 39	"For Director, District No. 9: "Total ..... 95
Charles Dwight Avery..... 3	Wendell P. Brown..... 30
Scattering ..... 11	Clyde Tucker Morris..... 26
Blank ..... 0	Arthur Horace Blanchard..... 12
Void ..... 0	Scattering ..... 21
Total ..... 53	Blank ..... 6
	Void ..... 0

"For Director, District No. 7: "Total ..... 95

Ralph Budd..... 86	"For Director, District No. 12: "Total ..... 42
Elwyn Francis Chandler..... 18	Joseph Jacobs..... 18
Scattering ..... 28	David Christiaan Henny..... 3
Blank ..... 6	Ernest Bertrand Hussey..... 3
Void ..... 3	Scattering ..... 18
Total ..... 141	Blank ..... 0
	Void ..... 0

"Respectfully submitted,

"WILBUR T. WILSON,  
B. S. VOORHEES,  
LOUIS H. SHOEMAKER,

"BENJAMIN SCHWERIN,  
THOMAS F. MCQUADE,  
RALPH H. MANN,  
"Tellers."

## Status of Topographic Mapping in the United States

The following resolution with reference to the \$5 000 000 program for completing the fundamental leveling and triangulation nets of the United States, was adopted at the Joint Meeting of the Surveying and Mapping and City Planning Divisions on January 19, 1928, and subsequently approved by the Board of Direction at its meeting of April 23, 1928:

*"Whereas, in all major engineering operations, including city surveys and planning, highway development and extension, irrigation projects, hydroelectric development, improvement of rivers for navigation, flood control of rivers, and general topographic surveying and mapping, a knowledge of elevations and geographic positions is essential to their efficient and economic operation; and,*

*"Whereas, the area of the United States is now only partially supplied with data furnishing geographic positions and elevations; and,*

*"Whereas, the necessity for the execution of nets of leveling and triangulation which furnish elevations and geographic positions, respectively, is nationwide and must be carried on as a unit; and,*

*"Whereas, great economies would be effected by having the leveling and triangulation systems executed by the Federal Government, thus eliminating duplicate organizations; and,*

*"Whereas, each State will secure the benefits of such work by the Federal Government and since the obtaining of State funds for the fundamental data would greatly delay the time at which such data would become available; and,*

*"Whereas, the expense of completing the fundamental leveling and triangulation nets of the country would be not more than \$5 000 000 according to the estimate of the Board of Surveys and Maps of the Federal Government; be it therefore*

*"Resolved, that the Divisions of City Planning and of Surveying and Mapping of the American Society of Civil Engineers, meeting jointly on this date, recommend to the Board of Direction of the American Society of Civil Engineers that it consider this very important question of the lack of fundamental elevations and geographic positions for the United States, with a view to making recommendations to the President of the United States, in order that the data may be secured and made available within a reasonable number of years; and be it further*

*"Resolved, that the Board of Direction consider recommending to the President of the United States that the entire cost of the fundamental triangulation and leveling systems be considered as National projects, to be paid for entirely from the Treasury of the United States."*

### Present Inadequacy

Further information on the status of topographic mapping in the United States is contained in the following résumé by the Surveying and Mapping Division, published for the information of the membership.

All nations that have entered the intensive industrial stage spend large sums of money on engineering projects and manufacturing plants. Engineers have found by experience that to spend money in securing adequate data before a project is begun is not only a wise investment but a necessary precaution. Practically all large engineering and industrial projects are dependent on map data, either directly in relation to plant and project sites, or indirectly in the way of information relating to raw material or to markets.

It has been truly said that only a very wealthy nation can long afford to undertake large engineering projects without adequate map data.

The standard topographic mile-to-the-inch map published by the U. S. Geological Survey is widely recognized as meeting all requirements for a general utility map for engineers. Maps on a larger scale are necessary in restricted areas, but the making of that class of maps lies outside the province of the Federal Government.

The topographic mapping of nearly every country possessing a high degree of industrial development has progressed to, or almost to, the point of completion. The United States, on the contrary, has only 43% of its area topographically mapped and half the existing maps fail to meet present-day standards of accuracy.

Control surveys in the form of triangulation and traverse for horizontal positions and leveling for elevations form an essential part of the topographic mapping of an area. They are the framework on which the detailed surveying is based and are essential to the accuracy of the completed map. The fundamental first-order triangulation and leveling has been done largely by the U. S. Coast and Geodetic Survey. Interstate projects of first and second-order triangulation and leveling still remaining to be done amount to about 39 000 miles of triangulation and 70 000 miles of leveling.

#### **Cost to Complete**

To complete the topographic surveys for the unmapped 57% of the area of the United States, to revise the maps already made which are obsolete, and to make the necessary control surveys, will require only an amount equal to the cost of one battleship.

The field and office expenses for mapping the areas not yet mapped, including the detailed third-order control surveys, are estimated at \$45 000 000. To revise the older topographic sheets made with inadequate accuracy, or with lack of sufficient detail, will require about \$5 000 000. The interstate belts of first-order triangulation and lines of first-order levels will cost about \$900 000 and the intrastate first and second-order triangulation and levels will cost about \$4 000 000, including both field and office expenses. The total cost, therefore, of making the control and topographic surveys necessary to complete the general utility map of the country, including the publication of the results, will be about \$55 000 000.

The Temple Act, passed in 1924, authorized the President to complete the topographic mapping of the United States, using such agencies as he might designate. It carried an authorization of appropriation of \$950 000 for the fiscal year ending June 30, 1926.

#### **Special Uses**

An accurate map is essential to the engineer and is the foundation for the plans of financiers and business men on many of their large enterprises. It will suffice to point out their special value to a few classes of projects.

**Mineral Investigations**

The need of the economic geologist for maps was the controlling factor in the organization of the U. S. Geological Survey fifty years ago and in the starting of the standard topographic map to replace the earlier exploratory and reconnaissance maps. The location of a mineralized area must be known in its relation to sources of supply, routes of supply and of communication, water supply, areas for the disposal of waste, possible location of pipe and power lines, and areas of development.

**Power Project and Flood Control**

The location and elevation of dam sites, areas of drainage, and flood basins, the possible location of transmission lines, and many other engineering details must be known with considerable accuracy before final plans for construction can be adopted. Rescue work, when a river has broken from its banks, as did the Mississippi and certain rivers in New England during 1927, is greatly facilitated by the knowledge of the configuration of the flood areas as furnished by topographic maps. Contoured maps of the Mississippi River Basin will have to be made for a comprehensive study of the flood control of that stream.

**Soil Surveys**

Where topographic maps are not available special surveys must be made by the U. S. Department of Agriculture before soil survey maps can be produced. These special purpose maps are not of sufficient detail to be of much value for other purposes.

**Reclamation and Irrigation**

A general utility map is adequate for all preliminary studies and estimates for this class of projects; but if such a map is not available a special survey must be made at considerable expense.

**Roads, Canals, Etc.**

Road locations cannot be made as well from route surveys as by the use of regional contoured maps. It has been estimated that the completed standard topographic map would have saved on the National highway program alone enough to pay the entire cost of completing the map.

As an instance in point, a highway was proposed in Tennessee to connect two points 15 miles apart, air-line distance. After the usual location surveys a route was selected, which was 26.3 miles long, with some heavy grades, and estimates for construction were computed. Before the work was begun, however, a topographic map of the region was made at a cost of \$2 200. From this a route 19 miles long was selected—one giving flatter grades and a saving of \$200 000 in the estimated cost of construction. This merely shows that the \$2 200 topographic map should have been made in the beginning.

**Conservation and Forestation**

Any study of the conservation of National resources must rely for much of its accuracy and value upon maps and the knowledge of the configuration of

the ground obtained from them. On the other hand, any generalizations which are not based upon the study of, and measurements from, accurate maps must inevitably be regarded with a measure of doubt.

#### Aviation

The recently augmented interest in commercial aviation has resulted in the establishment of commercial lines maintaining regular flight schedules over airways traversing all parts of the country. This has created an urgent need for special airways maps for the guidance of pilots. Congress has recently authorized and directed that such maps be produced.

The standard topographic map must furnish the basis for this special product. Along many of the important routes the standard map is lacking or incomplete, and the special airways maps cannot be prepared even if urgently needed.

#### Benefits of General Map

Surveys for special purposes will usually serve only that particular purpose. A general utility map will answer practically all purposes. Much of the money spent in special purpose surveys represents an enormous National loss.

There are many cases where each of a number of companies or political units has collected survey data in a single locality. Each survey was expensive, and the cost was added to the capital account of the corporation having the survey in charge, or was paid for from taxes. No single survey benefited any other. A general utility topographic map would have eliminated the largest part of the cost of each, and the results would have been available for later projects.

## Meetings of the Board of Direction

This is an abstract of the notes of the Secretary and subject to approval by the Board of Direction at its next meeting.

The Board met at 10:07 A. M., at the Hotel Statler, Buffalo, N. Y.; President Lincoln Bush in the chair; George T. Seabury, Secretary; and present, also, Messrs. Bell, Dennis, Dougherty, Dufour, Eddy, Fowler, Fuller, Hammond, Hatton, Hoyt, Johnston, Knowles, Morgan, Pirnie, Ray, Sawyer, Taber, and Williams.

### Approval of Minutes

The minutes of the meetings of the Board of Direction held on April 23 and 24, 1928, were approved.

### Mid-South Section

Approval was given to the formation of a Mid-South Section of the Society, with headquarters at Memphis, Tenn., a petition signed by 58 members requesting the establishment having been received.

### Power Division Amends Constitution

An amendment proposing the elimination of Power Division dues canvassed on May 17, 1928, resulting in an overwhelmingly favorable vote, was approved.

### John Fritz Medal

President Bush was appointed as the representative of the Society on the John Fritz Medal Board to replace Past-President Grunsky at the expiration of his term in October, 1928.

### Committee on Professional Conduct

The Committee on Professional Conduct reported on four cases it had considered, including the following report on a hypothetical question, which report was approved:

"Question: Engineer B was engaged for approximately two years as principal assistant on the design and supervision of construction of an hydraulic-fill dam for a Municipality.

"Some months after the above service had terminated serious slides developed in the portion of the dam then under construction and, with the knowledge and consent of the City's supervising engineers, Engineer B was employed, by the sub-contractor doing the hydraulic fill, to help work out methods for correcting the slides and to visit the work at intervals for several months thereafter and advise with said sub-contractor.

"Some time after finishing the above advisory service for the sub-contractor Officials of the Municipality requested Engineer B to serve the City in making a general examination of all features of the construction of the dam mentioned above prior to its final acceptance and to report on the stability and safety of the structure.

"Before accepting this assignment from the City, Engineer B, in writing as well as verbally, called the attention of the City Officials to his former connections with this project both with the City and later with the sub-contractor. He also discussed this with the remaining supervising engineer who expressed approval.

"Engineer B served with Engineer A, who had been similarly selected, in making the above examination and a joint report was rendered, substantially approving the work.

"Did Engineer B violate the Code of Ethics?"

The unanimous opinion of the Committee on Professional Conduct was that:

"Engineer B did not violate the Code of Ethics. The Municipality, however, adopted a rather unusual procedure in asking an engineer who had been in the employ of the contractor to examine and report on the dam for the Municipality, at least without the concurrent services of an entirely disinterested engineer."

#### **Report of Committee on Technical Expansion**

The report of the Committee on Technical Expansion recommending certain changes with respect to the monthly Society Meetings and Society Publications, and measures for promoting the effectiveness of the Technical Divisions, was adopted. This report appears on page 381 of this number of *Proceedings*.

#### **Committee on Joint Society Activities Re-Appointed to Draft Statement to Accompany Ballot on Joining American Engineering Council**

Pursuant to a resolution adopted by the Board, the Special Committee on Joint Society Activities which reported to, and was discharged at, the July, 1927, Board Meeting, was re-appointed for the purpose of preparing a statement to accompany a referendum ballot to be issued to the membership with respect to the Society joining American Engineering Council. The resolution appears on page 384 of this number of *Proceedings*.

#### **Committee on Mississippi River Flood Discharge**

The Special Committee on Mississippi River Flood, consisting of Messrs. John F. Stevens, *Chairman*, J. W. Billingsley, John F. Coleman, J. D. Gallogay, Morris Knowles, Daniel W. Mead, and J. Waldo Smith, was discharged with thanks.

#### **Letter of Congratulation to Herbert Hoover**

A letter, to be signed by the President and Secretary, was authorized to be sent to Herbert Hoover, Hon. M. Am. Soc. C. E., conveying the congratulations of the Board on his nomination to the office of President of the United States.

**Members of American Engineering Societies in France  
Form an Association**

It was reported that an Association of American Engineers in France had been formed, and that the other three National Societies had each contributed \$100 to further such association. On motion, a contribution of \$100 was authorized by the Society.

**Local Sections\***

**Illinois.**—June 12, 1928. A Luncheon Meeting of the Section was held at the Chicago Engineers' Club. After a brief address by President Moss, Colonel Edward H. Schulz, Corps of Engineers, U. S. Army, presented the certificates for Junior Membership in the Society to six graduate students in Civil Engineering selected by the Educational Committee. The recipients of the awards were as follows: Merrill B. Gamet and E. O. Williams, Northwestern University; W. A. Anderson, and W. W. Kerr, Jr., Armour Institute of Technology; Charles R. Little, Purdue University; and J. E. Goddard, Rose Polytechnic Institute. Colonel Schulz gave an interesting talk to the students, after which various business matters of local interest were transacted. Attendance 34.

**Louisiana.**—July 5, 1928. At a meeting of the Section held at the home of Mr. Ole K. Olsen, the following officers were elected for the ensuing year: President, B. H. Grehan; First Vice-President, C. M. Kerr; Second Vice-President, E. S. Lanphier; Secretary, A. F. Jacobi; and Treasurer, C. N. Bott. Attendance 20.

**Northeastern.**—May 25, 1928. This was a luncheon meeting held at the Boston City Club at which Mr. Karl R. Kennison was elected to fill the vacancy in the office of President for the remainder of the term. Past-President Charles W. Sherman gave an account of the Spring Meeting held at Washington, D. C., and also told of the work of the Committee on Student Chapters, of which Committee he is Chairman. Lieutenant Donald G. Duke then spoke on "The Development of Air Ports", after which the meeting was adjourned. Attendance 42.

\* For list of Local Section Officers, Rules, etc., see 1928 Year Book, p. 46.

## Engineering Societies Library

The services of the Engineering Societies Library are available to all members who wish searches, copies, translations, etc., or advice on technical literature. A collection of modern books is also available for loan to members in North America, at moderate rentals. Correspondence should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York, N. Y., who will gladly give information concerning the charges for the various kinds of work. A more comprehensive statement in regard to this matter will be found on pages 71 and 72 of the Year Book for 1928.

### Book Notices\*

(July 2 to July 31, 1928)

**The Evolution and Classification of Soils.** By E. Ramann. Translated by C. L. Whittles. Cambridge, W. Heffer & Sons, 1928. 127 pp., 9 x 6 in., cloth. 7/6.

This book summarizes the fundamental facts regarding the formation of soils; the close connection between climate and soil; the relationship of one soil to another and classifies soil types on a true scientific basis.

**Plumbing.** By Harold E. Babbitt. N. Y., McGraw-Hill Book Co., 1928. 455 pp., illus., diagrams, tab., 9 x 6 in., cloth. \$5.00.

This text, for those who are interested in the design and installation of plumbing contains the latest standard practices and incorporates the results of recent research work done by the U. S. Bureau of Standards and the University of Illinois.

**Stair Builder's Guide.** By Morris Williams. N. Y., Scientific Book Corporation, 1928. 259 pp., illus., diagrams, 8 x 5 in., cloth. \$3.00.

This volume explains the simplest method of stair building. It takes up the construction details; the fundamentals of wreath rail constructions; the arrangement of risers in and around the cylinder; and gives illustrations of stairways in homes and public buildings.

### Additions to the Reading Room

**Mechanics for Engineers, Statics and Kinetics.** By Julian C. Smallwood and Frank W. Kouwenhoven. N. Y., D. Van Nostrand Co., Inc., 1928. 195 pp., diagrams, 9 x 6 in., buckram. \$2.50.

This book is intended to meet the progress made by universities in the development of their engineering curricula according to the demands of industrial requirements. In it are found a new arrangement and selection of material, a combination of problems with text for the exercise of the best pedagogy, and an emphasis upon those subjects important to engineering students in applied mechanics.

**Principles of Valuation.** By John Alden Grimes and William Horace Craigie. N. Y., Prentice-Hall, Inc., 1928. 291 pp., charts, tab., 9 x 6 in., buckram. \$10.00.

This volume shows how to determine the true valuation of the future income of properties subject to regular or fluctuating returns. It covers the effects of income taxes on property and correlates all the methods of valuation in a way which permits of ready comparison, and takes up the advantages and disadvantages of each.

\* The statements made in these notices are taken from the books themselves, and this Society is not responsible for them. Unless otherwise specified, the books in this list have been donated by publishers.

## Current Civil Engineering Literature

### Key to Abbreviated References to Publications Indexed\*

#### Abbreviated References.

#### Publication.

#### Place.

Am. C. Inst.	American Concrete Institute, <i>Proceedings</i> (Y.)	Detroit
A. I. E. E.	American Institute of Electrical Engineers <i>Journal</i> (M.)	New York
A. R. E. A.	American Railway Engineering Association, <i>Proceedings</i> (Y.)	Chicago
A. S. T. M.	American Society for Testing Materials, <i>Proceedings</i> (Y.)	Philadelphia
Am. Soc. C. E.	American Society of Civil Engineers, <i>Proceedings</i> (M.)	New York
Am. Soc. Mun. Impvts.	American Society for Municipal Improvements, <i>Proceedings</i> (Y.)	New York
Am. W. W. Assoc.	American Water Works Association, <i>Journal</i> (M.)	Baltimore
Am. Wood Prs. Assoc.	American Wood Preservers Association, <i>Proceedings</i> (Y.)	Chicago
Ann. P. et C.	Annales des Ponts et Chaussées (Bi-M.)	Paris
Ann. T. P. Belg.	Annales des Travaux Publics de Belgique (Bi-M.)	Brussels
Assoc. Ing. Gand.	Annales de l'Association des Ingénieurs sortis des Ecoles Spéciales de Gand (Q.)	Ghent
Bost. Soc. C. E.	Boston Society of Civil Engineers, <i>Journal</i> (M.)	Boston
Can. Engr.	Canadian Engineer (W.)	Toronto
City Plan.	American City Planning Institute (Q.)	Boston
Comwith. Engr.	Commonwealth Engineer (M.)	Melbourne
Cornell C. E.	Cornell Civil Engineer (M.)	Ithaca
Dock & Harbour	Dock and Harbour Authority (M.)	London
Eng.	Engineering (W.)	London
Eng. & Contr.	Engineering and Contracting (M.)	Chicago
Eng. Inst. Can.	Engineering Institute of Canada, <i>Journal</i> (M.)	Montreal
Eng. N. R.	Engineering News-Record (W.)	New York
Engr. Soc. W. Pa.	Engineers' Society of Western Pennsylvania, <i>Journal</i> (M.)	Pittsburgh
Engr.	Engineer (W.)	London
Engrs. & Eng.	Engineers and Engineering, <i>Engineers' Club of Philadelphia</i> (M.)	Philadelphia
Gas und Wasser.	Gas und Wasserfach	Munich
Gen. Civ.	Le Génie Civil (W.)	Paris
Gesund. Ing.	Gesundheits Ingenieur (W.)	Munich
Inst. C. E.	Institution of Civil Engineers Minutes of Proceedings (Q.)	London
Inst. Mun. & Co. Engrs.	Institution of Municipal and County Engineers, <i>Journal</i> (W.)	London
Int. Ry. Cong. Assoc.	International Railway Congress Association, <i>Bulletin</i> (M.)	Brussels
Land. Arch.	Landscape Architecture (Q.)	Boston
Mech. Eng.	Mechanical Engineering (M.) <i>Journal of the American Society of Mechanical Engineers</i>	New York
Mil. Engr.	Military Engineer (Bi-M.)	Washington
Min. & Metal.	Mining and Metallurgy (M.) <i>American Institute of Mining Engineers</i>	New York
Mun. N.	Municipal News (M.)	Chicago
N. E. W. W. Assoc.	New England Water Works Association, <i>Journal</i> (Q.)	Boston
N. Y. R. R. Club.	New York Railroad Club, <i>Proceedings</i> (M.)	Brooklyn
Oest. Ing. Arch. Ver.	Oesterreichischer Ingenieur und Architekten Verein, <i>Zeitschrift</i> (F.)	Vienna
Power	Power (W.)	New York
Public W.	Public Works (M.)	New York
Rev. Gen.	Revue Générale des Chemins de Fer (M.)	Paris
Ry. Age.	Railway Age (W.)	New York
Ry. Eng. & Maint.	Railway Engineering and Maintenance (M.)	Chicago
R. & S.	Roads and Streets (M.)	Chicago
Schw. Bauz.	Schweizerische Bauzeitung (W.)	Zurich
Sci. Am.	Scientific American (M.)	New York
Soc. Ing. Civ. Fr.	Société des Ingénieurs Civils de France, <i>Mémoires et Comptes Rendus</i> (Q.)	Paris
Tech. Gemein.	Technisches Gemeindeblatt (F.)	Berlin
Ver. deu. Ing.	Verband deutscher Ingenieure, <i>Zeitschrift</i> (W.)	Berlin
W. W.	Water Works (M.)	Chicago
West. Constr. N.	Western Construction News (F.)	San Francisco
West. Ry. Club.	Western Railway Club, <i>Proceedings</i> (M.)	Chicago
West. Soc. Engrs.	Western Society of Engineers, <i>Journal</i> (M.)	Chicago
Zeit. Bau.	Zeitschrift für Bauwesen (Q.)	Berlin
Z. d. Bauver.	Zentralblatt der Bauverwaltung (W.)	Berlin

\* Y = Yearly; Q = Quarterly; M = Monthly; F = Fortnightly; W = Weekly.

## A. Applied Sciences

### a. Processes of Calculation

#### 3. Stresses and Strains

Berge Proportion Method.\* O. Berge. Eng. & Contr. June, '28.

## B. Applied Mechanics

### a. Mechanics of Solids (Strength of Materials)

#### 2. Elastic Solids

Die Kerbe.\* (The Notch.) F. Laszlo. Ver. deu. Ing. June 16, '28.

#### 3. Jointed Systems.

Die Graphische Berechnung der kontinuierlichen Träger mit frei und elastisch drehbarer Stützung nach dem ebenen Massenschwerpunkt und Seilpolygon-Verfahren.\* (The Graphic Calculation of Continuous Beams with Free and Elastic Turning Support, Using the Plane Gravity and Link Polygon Methods.) Peter Pasternak. Schw. Bauz. Serial beginning June 16, '28.

#### 6. Heterogeneous Solids (Reinforced Materials)

The Carrying Capacity of Semicircular Hooks.\* T. D. Mylrea. Am. C. Inst. Vol. 24, 1928. The Calculation of Flat Plates by the Elastic Web Method.\* Joseph A. Wise. Am. C. Inst. Vol. 24, 1928.

Coupoles et Voûtes en Béton Armé.\* (Reinforced Concrete Domes and Arches.) Henry Lossier. Gen. Civ. June 9, '28.

Les Planchers en Béton Armé, Sans Nervures, Dits Planchers-Champignons.\* (Reinforced Concrete Floors without Ribs, Called Mushroom Floors.) Gen. Civ. June 2, '28.

### b. Hydraulics.

#### 2. Physical Hydraulics

Variable Flow in Open Channels.\* A. P. Flockhart. Eng. June 8, '28.

#### 3. Industrial Hydraulics

The Bhira Station of the Tata Hydro-Electric Power Company.\* Eng. Serial beginning June 15, '28.

Hydro-Electric Developments in Lenarkshire.\* Eng. Serial beginning June 22, '28.

Hydro-Electric Plant Built on High Piers.\* L. F. Harza. Power June 26, '28.

Power House Supported on Piers Over Dam.\* Eng. N. R. June 28, '28.

Hydro-Electric Power in Nova Scotia.\* Can. Engr. July 3, '28.

The Galleto Hydro-Electric Installation.\* Eng. July 6, '28.

Hydro-Electric Redevelopment on Missouri River.\* R. A. Moncrieff. Eng. N. R. July 12, '28.

Die Wasserkraftwirtschaft im neuen Deutschland.\* (The Water Power Industry in the New Germany.) E. Mattern. Z. d. Bauver. May 23, '28.

#### 4. Dams

Multi-Centered Fixed Ended Arch Rings of Arch Dams, and Their Analysis.\* F. W. Hanna and T. L. E. Haug. West. Constr. N. June 25, '28.

Some Features of the Testing of Stevenson Creek Arch Dam.\* Willis A. Slater. Am. C. Inst. Vol. 24, '28.

## C. Materials of Construction and General Processes

### a. Lime, Cement, Mortar, Concrete, Brick, Bitumen, Timber, Gravel, etc.

Gradation and Character of Aggregates as a Factor in Workability.\* A. T. Goldbeck. Am. C. Inst. Vol. 24, 1928.

Cement as a Factor in the Workability of Concrete.\* P. H. Bates and J. R. Dwyer. Am. C. Inst. Vol. 24, 1928.

A Study of Some Methods of Measuring Workability of Concrete. George A. Smith and George Conahey. Am. C. Inst. Vol. 24, 1928.

Drying Concrete Brick to Take Out the Shrinkage. L. E. Grube. Am. C. Inst. Vol. 24, 1928. Experience in the Use of Light Weight Aggregate in the Manufacture of Concrete Masonry Units. A. W. Scheer. Am. C. Inst. Vol. 24, 1928.

Formulating Portland Cement Stucco. William S. Steele. Am. C. Inst. Vol. 24, 1928.

Pacific Stone. A Dry Tamped Product. Gilbert E. Tucker. Am. C. Inst. Vol. 24, 1928. Viewpoint of Architect and Engineer Regarding Concrete Products. George J. Eyrick, Jr. Am. C. Inst. Vol. 24, 1928.

Flow of Concrete Under Sustained Compressive Stress.\* Raymond E. Davis. Am. C. Inst. Vol. 24, 1928.

Study of a Method for Testing Concrete in the Field.\* C. A. Wiepking. Am. C. Inst. Vol. 24, 1928.

Crazing in Concrete and the Growth of Hair Cracks Into Structural Cracks.\* Alfred H. White and others. Am. C. Inst. Vol. 24, 1928.

Notes on the Progress of Some Studies of the Crazing of Portland Cement Mortars.\* P. H. Bates and C. H. Jumper. Am. C. Inst. Vol. 24, 1928.

A Method for Predicting Concrete Strengths with Increased Precision. Herbert J. Gilkey. Am. C. Inst. Vol. 24, 1928.

What Workability Means to the Contractor.\* Nelson L. Doe. Am. C. Inst. Vol. 24, 1928.

Workability Means Durability to the Engineer. R. W. Atwater. Am. C. Inst. Vol. 24, 1928.

Water as a Factor in Workability.\* R. L. Berlin. Am. C. Inst. Vol. 24, 1928.

Report of Committee E-5, Aggregates.\* Am. C. Inst. Vol. 24, 1928.

Researches on Concrete Materials and on Plain and Reinforced Concrete. Am. C. Inst. Vol. 24, 1928.

Concrete Primer.\* Am. C. Inst. Vol. 24, 1928.

Better Concrete—Do We Mean It? Nathan C. Johnson. Am. C. Inst. Vol. 24, 1928.

Core Tests Lead to Proportioning by Weight.\* C. E. Forster. Eng. N. R. July 5, '28.

**Das Gesker Kreidevorkommen und seine Eignung zur Gewinnung von Naturzement.\*** (The Gesker Chalk Deposit and Its Suitability for Making Natural Cement.) Haegermann. Z. d. Bauver. Serial beginning May 30, '28.

#### b. Metals

**Zur Ableitung einer Fließbedingung.\*** (On the Derivation of a Flow Limit.) G. Sachs. Ver. deu. Ing. June 2, '28.

**Die Molekulartheoretischen Grundlagen der Festigkeitseigenschaften des Werkstoffkernes.\*** (The Molecular Theory Basis of the Strength Properties of the Grain of Material.) Adolf Smekal. Ver. deu. Ing. May 19, '28.

#### c. Preservation and Use of Materials, Painting, Waterproofing.

**Decorative Painting on Concrete.** Sidney F. Ross. Am. C. Inst. Vol. 24, 1928.

#### f. Rock Excavation, Mining, Rock Removal

**Abstracts of Institute Publication.** Min. & Metal. July, '28.

**Brückenkabelbagger für eine Braunkohlegrube.\*** (Bridge Cable Dredge for a Brown Coal Mine.) Ver. deu. Ing. June 2, '28.

**Die stetigen Förderer der Verladeanlage auf Gräfin Johanna Schacht in Bobrek O.-S.\*** (The Continuous Conveyor at the Loading Bridge of the Graf Johanna Shaft in Bobrek O.-S.) W. Franke. Ver. deu. Ing. May 19, '28.

#### g. Execution of Works, Specifications

**Design and Cost Data for the 1928 Joint Standard Building Code.\*** Arthur R. Lord. Am. C. Inst. Vol. 24, 1928.

**Standard Building Units.** (Comm. P-1.) Am. C. Inst. Vol. 24, 1928.

#### 2. Of Concrete

**Experience with a Strength Specification Contract.\*** Robert C. Johnson. Am. C. Inst. Vol. 24, 1928.

**Heavy Duty Concrete Floors.\*** C. E. Covell. Am. C. Inst. Vol. 24, 1928.

**Specifications for Concrete Stone.** C. Van de Bogart. Am. C. Inst. Vol. 24, 1928.

**Concrete Roofing Tile Problems.** Leslie H. Allen. Am. C. Inst. Vol. 24, 1928.

**Water-Cement Ratio Concrete.\*** R. P. V. Marquardsen. Eng. & Contr. June, '28.

#### 4. Of Metal

**Construction Methods Used on Chicago's New Woolworth Building.\*** Eng. & Contr. July, '28.

**Removable Steel Stadium for University of Chicago.\*** Lester L. Ries. Eng. N. R. July 5, '28.

#### 5. Of Reinforced Concrete

**Reinforced-Concrete Building Regulations and Specifications (Comm. E-1).** Am. C. Inst. Vol. 24, 1928.

**Reinforced-Concrete Walls for Buildings.\*** W. E. Hart. Am. C. Inst. Vol. 24, 1928.

**Reinforced Concrete as Applied to Monumental Buildings.** Emil Praeger. Am. C. Inst. Vol. 24, 1928.

**Open-Air Swimming Pool on Roof of Langham Apartments, Los Angeles.\*** H. S. Wright. West. Constr. N. June 10, '28.

#### x. Miscellaneous

**Fifteen Floors in Thirty Days on Steel and Tile Office Job.\*** K. R. Wagner. Eng. & Contr. June, '28.

**Estimating and Cost Accounting for General Contractors.** J. F. Leitch. (Paper read before Constr. Assoc. of Canada.) Eng. & Contr. July, '28.

#### k. Tunnels and Tunnelling-Shields

**Work Begun on Vehicular Tube from Detroit to Windsor.** Eng. N. R. June 21, '28.

**Moffat Tunnel Ventilation for Steam Locomotives.** Eng. N. R. June 28, '28.

### D. Highways

#### a. Location

**Das Kraftwagen-Strassenetz Deutschlands.\*** (The Automobile Road System of Germany.)

Ph. A. Rappaport. Ver. deu. Ing. May 12, '28.

**Geistespunkte der Hygiene bei der Anlage von Strassen.\*** (Criteria for Hygiene in the Design of Streets.) Gustav Langen. Gesund. Ing. Apr. 14, '28.

#### c. Construction

**A \$250 000 Per Mile Interurban Highway in Scotland.\*** C. L. McKesson. (From paper read before West. Assoc. of State Highway Officials.) Mun. N. June, '28.

**Five Miles of Concrete Pavement Laid by Batch-Box Method.\*** Mun. N. June, '28.

**Notes on Road Construction in Cork City.** S. W. Farrington. Inst. Mun. & Co. Engrs. June 12, '28.

**Field Control of Pavement Concrete.** H. S. Mattimore. (Paper read before Univ. of Michigan.) Can. Engr. June 12, '28.

**Quebec System of Provincial Highways.\*** (Abstract from Report Issued by Dept. of Roads.) Can. Engr. June 19, '28.

**Strength Specification Concrete for Street Paving.\*** F. A. Hess. Eng. N. R. June 21, '28.

**Advanced Roadbuilding on Georgia's Coastal Road.\*** H. J. Friedman. Eng. N. R. June 21, '28.

**Emulsified Asphalt Road Surfacing.\*** West. Constr. N. June 25, '28.

**Studies of Concrete Pavement Cores.\*** C. E. Foster. (Paper read before Michigan Highway Conference, Univ. of Mich.) Can. Engr. July 10, '28.

**Strassenbau in Holland.\*** (Street Construction in Holland.) R. Loman. Ver. deu. Ing. May 12, '28.

**Sicherung unterirdischer Einbauten anlässlich der Ausführung von Tiefbau-Anlagen in öffentlichen Strassen.\*** (Securing Underground Constructions when Building Foundations in Public Streets.) Wilhelm Voit. Gesund. Ing. Apr. 21, '28.

Die Prüfverfahren für Strassenbaustoffe und ihre Bewertung.\* (Testing Methods for Road Materials and Their Evaluation.) E. Neumann. Ver. deu. Ing. May 12, '28. Der städtische Strassenbau.\* (Municipal Street Construction.) W. Bree. Ver. deu. Ing. May 12, '28.

Die Bauverfahren für Landstrassen.\* (Construction Methods for Country Roads.) E. h. Nagel. Ver. deu. Ing. May 12, '28.

#### d. Maintenance

Street Maintenance in Small City. Claude Draper. (Paper read before Purdue Road School.) Mun. N. Mar., '28.

Secondary Road Maintenance. R. B. F. Chisholm. (Paper read before Purdue Univ.) Can. Engr. July 10, '28.

#### e. Street Cleaning, Dust Prevention, Snow Removal

Street Cleaning in Toledo. Public W. June, '28.

Die Bedeutung der Straubekämpfung im neuzeitlichen Strassenbauwesen.\* (The Importance of Fighting Dust in Modern Road Building.) E. Neumann. Gesund. Ing. Apr. 14, '28. Strassenstaubbindemittel. (Street Dust Palliations.) W. Liesegang. Gesund. Ing. Apr. 14, '28.

Zur grossstädtischen Verkehrshygiene. (Traffic Hygiene in Large Cities.) M. Hahn. Gesund. Ing. Apr. 14, '28.

#### g. Machinery and Tools

Mechanical Spreading, Raking, Finishing of Asphaltic Concrete Pavement. C. S. Pope. (From *California Highways and Public Works*.) Comwith. Engr. May, '28.

Maintenance and Management of State Highway Equipment.\* W. A. Van Duzer. Pub. W. July, '28.

County Road Maintenance Methods and Equipment.\* Pub. W. July, '28.

Die maschinellen Hilfsmittel des Strassenbaues.\* (Mechanical Aids in Road Construction.) G. Garboz. Ver. deu. Ing. May 12, '28.

Strassenbaumaschinen.\* (Road Building Machines.) George Klose. Tech. Gemein. June 20, '28.

#### h. Vehicles, Automobiles, Traffic

Traffic Regulation.\* Guy Kelsey. Sci. Am. July, '28.

The National Highway System.\* John P. Hallinan. Mil. Engr. July-Aug., '28. Strassenverkehr und Finanzierung des Strassenbaues.\* (Street Traffic and Financing Road Construction.) Speck. Ver. deu. Ing. May 12, '28.

### E. Bridges, Viaducts and Arches

#### b. Iron and Steel Bridges and Viaducts

Eads Bridge Pronounced Safe. Ry. Age. June 23, '28.

Erecting a Large Steel Arch Bridge in England.\* Eng. N. R. July 5, '28.

Einiges über den Bau der Kennebec-River-Brücke.\* (On the Construction of the Kennebec River Bridge.) A. G. Jedliczka. Oest. Ing. Arch. Ver. June 8, '28.

Neue französische Vorschriften für die Berechnung eiserner Brücken.\* (New French Specifications for the Calculation of Iron Bridges.) Z. d. Bauver. May 30, '28.

#### d. Concrete and Reinforced Concrete Bridges and Viaducts

The Design and Construction of a Skew Arch.\* S. C. Hollister. Am. C. Inst. Vol. 24, 1928. Rigid Frame Construction for Westchester County Park Commission.\* Arthur G. Hayden. Public W. June, '28.

Reinforced Concrete Arches. A. C. Hughes. (From *The Surveyor*.) Can. Engr. June 12, '28. Glasgow Hall Utilizes Concrete Arches of 110-Ft. Span.\* W. L. Scott. Eng. N. R. June 21, '28.

Rebuilding a Toll Bridge in Service.\* Charles E. Modjeski. Eng. N. R. June 21, '28. The King George V Reinforced Concrete Bridge at Glasgow.\* (From *Concrete and Constructional Engineering*.) Eng. & Contr. July, '28.

Concrete Bridge Construction on Curve.\* Eng. N. R. July 5, '28.

#### h. Computations, Tests, etc.

Eads Bridge Strength and Safety Indorsed by Engineers.\* Eng. N. R. June 28, '28.

Détermination Algébrique et Comparaison des Efforts dans un Arc à Deux Articulations et dans un Arc Encastré, de Type Particulier.\* (Algebraic Determination and Comparison of Stresses in a Double Hinged Arch and in a Fixed Arch of Special Type.) Wahl. Gen. Civ. June 9, '28.

### F. Inland Waters and Waterways

#### a. Natural Waterways (General Articles)

The St. Lawrence Waterway. Mech. Eng. July, '28.

#### c. Regulation of Waterways—Volume of Discharge, Freshets, Floods, Soundings

Flood Control Through Slope Correction.\* W. E. Elam. Eng. N. R. June 28, '28. A Flood Year on the Mid-Mississippi.\* John C. H. Lee. Mil. Engr. July-Aug., '28.

**d. Diverting Dams, Locks, Lifts, Elevators, Inclined Planes**  
Van Giesen Diversion Dam.\* Theodore T. Knappen. West. Constr. N. June 25, '28.

**g. Consolidation of Banks, Leakage, Maintenance of Channel, Dredging**  
Uferschutz an Wasserläufen II Ordnung.\* (Bank Protection on Water Courses of the II Class.) Rutz. Z. d. Bauver. May 30, '28.

### G. Maritime Works

**a. Behavior of Movements of the Ocean. Winds. Waves. Tides. Currents**  
Changes in Tidal Datum Planes. H. A. Marmer. Eng. N. R. July 12, '28.

**c. Vessels and Maritime Navigation, Lighthouses, Buoys, Various Signals**  
The New Canadian Pacific Liner *Duchess of Bedford*.\* Engr. June 1, '28.

**g. Dredges and Dredging. Force Pumps. Refloating and Removing Wrecks. Ice-Breakers**  
The Salving of the Ex-German Battle-Cruiser *Moltke*.\* Engr. June 1, '28.  
Performance of Pipe-line Cutter Dredge. William Gerig. Mil. Engr. July-Aug., '28.

**h. Wharves, Mooring Buoys, Harbor Equipment**  
The Grain Elevator System at Montreal.\* Engr. June 29, '28.  
Harbour Structures: Preservation and Deterioration of Materials. William G. Atwood. Dock & Harbour Serial beginning June, '28.  
Bristol Docks Extension.\* Dock & Harbour June, '28.  
Marine-Boring Organisms on the Pacific Coast.\* Eng. June 22, '28.  
L'Entrepôt de la Société des Docks Frigorifiques du Havre.\* (The Warehouse of the Société des Docks Frigorifiques du Havre.) Auguste Pawłowski. Gén. Civ. June 9, '28.  
Le Nouvel Outilage des Bassins du Port de Marseille. L'Équipement du Bassin du President Wilson.\* (The New Equipment of the Basins at the Port of Marseille. Equipment at the President Wilson Basin.) Gén. Civ. June 16, '28.

#### i. Harbors (General Articles)

The Harbour Plan of Chicago. Dock & Harbour June, '28.  
Port Improvements at New Orleans.\* Samuel Young. Dock & Harbour June, '28.  
The Port of Southampton.\* F. E. Wentworth-Shields. (Paper read before Inst. Mech. Engrs.) Eng. June 29, '28.

### H. Railroads. Street and Interurban Railways. Automobiles. Aeronautics

#### a. Railroads

##### 1. General Articles

New Water Supply Facilities Effect Economies on the Southern.\* Ry. Age June 9, '28.  
South African Railways Do Well.\* William Hoy. Ry. Age June 16, '28.

Work on Hudson Bay Railroad Progressing Rapidly.\* Eng. N. R. July 12, '28.

##### 3. Roadbed (Grading Construction Work)

Is Concrete Better Than Cross-ties.\* F. D. McHugh. Sci. Am. July, '28.

##### 4. Track

D. & H. Goes Into Scrap Rail Cross Tie Production.\* Ry. Eng. & Main. June, '28.

Highway Crossing Construction Imposes Many Problems.\* F. W. Hillman. (Paper read before Main. of Way Club.) Ry. Eng. & Main. June, '28.

L. & N. Completes Second Track on Kentucky Division.\* Ry. Age June 30, '28.

L'Eclisse-Chevron.\* (The Chevron Fish-Plate.) Georges Coulie and Louis Cadis. Rev. Gen. June, '28.

##### 5. Signals and Safety Apparatus

Report on Safety Rules and Practices.\* (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Report of Committee on Couplers and Draft Gears.\* (A. R. A.) Ry. Age June 26, '28 (Daily Ed.).

Report of Committee on Brakes and Brake Equipment.\* (A. R. A.) Ry. Age June 26, '28 (Daily Ed.).

Report of Committee on Safety Appliances.\* (A. R. A.) Ry. Age June 26, '28 (Daily Ed.).

Report of the Committee on Loading Rules.\* (A. R. A.) Ry. Age June 27, '28 (Daily Ed.).

##### 6. Rolling Stock, Fuel

T. & P. Tests Special Firebox for Oil-Burning Locomotives.\* Ry. Age June 9, '28.

Oil-Electric Motive Power on the Canadian National.\* C. E. Brooks. Ry. Age June 9, '28.

Locomotive Designs to Reduce Maintenance.\* W. E. Woodard. (Abstract of paper read before Int. Ry. Fuel Assoc.) Ry. Age June 16, '28.

Reading to Use Triple-Unit, Gas-Electric Rail Car.\* N. L. Freeman. Ry. Age June 16, '28.

Track Exhibits of Locomotives Shown at Two Points.\* Ry. Age June 20, '28 (Daily Ed.).

Report of Automotive Rolling Stock Committee.\* (A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Report on Locomotive Design and Construction.\* (A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Burlington Freight Engine Shows Marked Economies.\* Ry. Age June 23, '28.

A 660-Hp., 87-Ton Oil-Electric Switching Locomotive.\* J. H. Harvey. Ry. Age June 23, '28.

Report of Committee on Utilization of Locomotives.\* (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Report of Committee on Electric Rolling Stock. (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Committee Report on the Lubrication of Locomotives.\* (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Freight and Passenger Car Exhibits.\* (A. R. A.) Ry. Age June 25, '28 (Daily Ed.).

The Wine 70-Ton Hopper Car.\* Ry. Age June 25, '28 (Daily Ed.).

Report of Committee on Locomotive and Car Lighting.\* (A. R. A.) Ry. Age June 26, '28 (Daily Ed.).

Report of the Committee on Tank Cars. (A. R. A.) Ry. Age June 27, '28 (Daily Ed.).  
Report of the Arbitration Committee. (A. R. A.) Ry. Age June 27, '28 (Daily Ed.).

Committee Report on the Lubrication of Cars.\* (A. R. A.) Ry. Age June 28, '28.

Report of Committee on Car Construction.\* (A. R. A.) Ry. Age June 28, '28.

Report of the Committee on Wheels.\* (A. R. A.) Ry. Age June 28, '28.

Burlington Acquires Modern Lounge Cars.\* Ry. Age June 30, '28.

Réparation des Foyers en Acier à la Compagnie d'Orléans.\* (Repair of Steel Fireboxes for the Compagnie d'Orléans.) J. Pezeu. Rev. Gen. June, '28.

#### 7. Use of Electricity

Shunting of Track Circuit in a Polyphase System of Continuous Inductive Train Control.\* C. F. Estwick. A. I. E. E. July, '28.

Milwaukee Tests Diesel Rail Car.\* Ry. Age July 7, '28.

#### 8. Stations, Terminals, Engine Houses, Shops

New Illinois Central Shops at Paducah.\* Frank R. Judd. West. Soc. Engrs. Mar., '28.

Modern Yards and Terminal Facilities. J. S. Morris. West. Ry. Club Apr., '28.

Canadian National Reorganizes Its Purchasing Methods.\* H. L. Taylor. Ry. Age June 9, '28.

Car Retarders Reduce Cost of Yard Operation on Norfolk & Western.\* Ry. Age June 16, '28.

Report on the Store Department Book of Rules.\* (A. R. A.) Ry. Age June 21, '28 (Daily Ed.).

Report on Design of Shops and Engine Terminal.\* (A. R. A.) Ry. Age June 21, '28 (Daily Ed.).

Report on Uniform Accounting of Material. (A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Report on Station Supplies and Printing.\* (A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Report on Reclamation and Scrap Handling.\* (A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Buildings and Facilities for Handling Material.\* (Report read before A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Control of Material and Supplies Requirements.\* (Report read before A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Railroad Power Plants and the Purchase of Power. A. A. Potter. (Paper Read before A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Report on Equipment Buying and Large Contracts. (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Report of the Committee on Fire Prevention. (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Missouri Pacific Centralizes Scrap Handling Salvage.\* Ry. Age June 23, '28.

Report on the Unit Pricing of Materials.\* (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Report of Committee on Manufacturing Material. (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Report of Committee on Control of Linn Stocks.\* (A. R. A.) Ry. Age June 23, '28 (Daily Ed.).

Rail Motor Cars Shown on Reading and Pennsylvania Tracks.\* Ry. Age June 23, '28 (Daily Ed.).

Report on Specifications and Test for Materials.\* (A. R. A.) Ry. Age June 27, '28 (Daily Ed.).

Report of Committee on Prices for Labor and Materials. (A. R. A.) Ry. Age June 27, '28 (Daily Ed.).

Modern Yards Complete Solution of B. & M. Terminal Problem.\* Ry. Age July 7, '28.

#### 9. Technical and Commercial Use

Report on Delivery of Material to Users.\* (A. R. A.) Ry. Age June 22, '28 (Daily Ed.).

Handling Perishables Speedily.\* Ry. Age July 7, '28.

#### d. Street Railways, Elevated Railways, Subways

##### 4. Track

Constructing a 4-Track Subway Section in Deep Rock Cut in New York.\* Frederick L. Cranford. (From *Proceedings, Brooklyn Engrs. Club.*) Eng. & Contr. June, '28.

##### 6. Traction

Effect of Street Railway Mercury Arc Rectifiers on Communication Circuits.\* Charles J. Daly. A. I. E. E. July, '28.

Interconnection of Power and Railroad Traction Systems by Means of Frequency Changers.\* Ludwig Encke. A. I. E. E. July, '28.

#### e. Automobiles

##### 2. Internal Combustion Engine Automobiles

Les Ateliers de Traitement Thermique des Usines d'Automobiles Willys-Overland, à Toledo, E. U.\* (Heat Treating Shops of the Willys-Overland Automobile Plant at Toledo, U. S.) Gen. Civ. June 16, '28.

#### f. Aeronautics

##### 1. General Articles

Airplanes and Terminals. T. C. Powell. West. Ry. Club May, '28.

Aviation as a Transportation Agency. W. P. MacCracken, Jr. West. Ry. Club May, '28.

The Rapid Development of Aviation. Clarence W. Young. Ry. Age June 26, '28 (Daily Ed.).

##### 4. Aerodromes and Landing Fields

Building an Airport at Portland, Oregon.\* James H. Polhemus. Eng. N. R. June 14, '28.

#### I. Municipal Water-Works. Agricultural Engineering. Irrigation

##### a. General Articles

Engineering Analysis Applied to Municipal Waterworks.\* William Shaw. Engrs. Soc. W. Pa. Mar., '28.

Hydraulic Works and Water Supplies in S. Australia.\* Herbert E. Bellamy. Comwidh. Engr. May, '28.

Grand Haven, Michigan, Gets New Water Works.\* Mun. N. May, '28.

New Water Works and Filtration Plant at Laredo, Texas.\* R. T. Reilly. Mun. N. June, '28.

The Mokelumne Water Project.\* Public W. June, '28.

Dissertation on Asheville's Water Supply. Stanley H. Wright. Public W. June, '28. The New Bloomington, Indiana, Water Works.\* Paul Hansen. Mun. N. June, '28. The New Bloomington, Indiana, Water Works.\* Paul Hansen. W. W. June, '28. New Waterworks for Broadstairs.\* Engr. June 8, '28. Denver Municipal Water Works.\* Jos. C. Coyle. West. Constr. N. June 10, '28. Municipal Water Works of Tacoma.\* W. A. Kunigk. West. Constr. N. June 10, '28. Water Supply System of Portland, Oregon.\* Ben. S. Morrow. West. Constr. N. June 10, '28. Die Wahrscheinlichkeit des Vorkommens von Regen grosser Intensität in einem bestimmten Zeitraume.\* (The Probability of the Occurrence of Heavy Rain in a certain Period of Time.) K. Pomianowski. Gesund. Ing. May 26, '28.

#### b. Hydrology, Water Resources

Deep Well to Provide Water Supply for New Community.\* Mun. N. Mar., '28. Recreational Use of Water Sheds of Public Water Supplies. W. L. Stevenson and H. E. Moses. (Paper read before Penn. W. W. Assoc.) Mun. N. June, '28. The Rainfall of New England.\* J. Henry Weber. N. E. W. W. Assoc. June, '28. Rainfall in New England During the Storm of November 3 and 4, 1927.\* X. H. Goodnough. N. E. W. W. Assoc. June, '28. Recreational Use of Water Sheds of Public Water Supplies. W. L. Stevenson and H. E. Moses. (Paper read before Penn. W. W. Assoc.) W. W. June, '28. Die Grundwasseraufnahme der Stadt Prag.\* (Obtaining Underground Water for Prague.) E. Prinz. Gas und Wasser. Serial beginning May 12, '28. Neue Absehnungsliniegleichung für Brunnen in ruhendem Grundwasser.\* (New Linear Equation for Lowering of Water Level in Wells in Stationary Ground Water.) H. P. Brinkhaus. Gesund. Ing. Apr. 28, '28. Ueber kapillare Leitung des Wassers im Boden.\* (On Capillary Conduction of Water in the Ground.) Ph. Forchheimer. Gas und Wasser. May 12, '28.

#### c. Dams and Reservoirs

Asphalt Grouting for Waterproofing and for Stopping Leakage.\* George W. Christians. Mun. N. June, '28. Asphalt Grouting for Waterproofing and for Stopping Leakage.\* George W. Christians. W. W. June, '28. The Farde Dam.\* Philip Schuyler. West. Constr. N. June 10, '28. Theories of the Cause and Sequence of Failure of the St. Francis Dam.\* Charles H. Lee. West. Constr. N. June 25, '28. Report on the Geology of St. Francis Damsite, Los Angeles County, California.\* Baily Willis. West. Constr. N. June 25, '28. Proportioning Concrete Mixes for the Coolidge Dam.\* Bruce Johnston. Eng. N. R. July 12, '28. Rupture du Barrage de l'Oued Fergoug, 26 Novembre 1927.\* (Failure of the Oued Fergoug Dam, November 25, 1927.) Ann. P. et C. Mar., '28. Der Einsturz der San Francis Talsperre in Kalifornien.\* (The Failure of the St. Francis Dam in California.) Schmidt. Z. d. Bauver. June 6, '28.

#### d. Analysis and Purification of Water

New Filtration Plant at Waukegan, Ill., Designed on Duplex Plan.\* Mun. N. Mar., '28. Phenol Pollution of Public Water Supplies in the Middle West. Herman N. Bundesen. W. W. June, '28. New Water Works and Filtration Plant at Laredo, Texas.\* R. T. Reilly. W. W. June, '28. Time Savers in Water Analysis.\* F. E. Daniels. Public W. Serial beginning June, '28. Iodine in the Public Water Supplies of Massachusetts.\* H. W. Clark. N. E. W. W. Assoc. June, '28. The Sand Filter and Filter Sand.\* Arthur L. Collins. West. Constr. N. June 10, '28. Control of Algal Growths in the Water Storage Reservoirs of Los Angeles.\* Carl Wilson. West. Constr. N. June 10, '28. Sacramento's Water Filtration Plant.\* Samuel A. Hart. West. Constr. N. June 10, '28. Emergency Water Disinfection During Recent Floods in California.\* Chester G. Gillespie. West. Constr. N. June 10, '28. Algal Control of Filter Basins, Canon City, Colorado, Water Works.\* A. W. Stedman. West. Constr. N. June 10, '28. Variations in British and American Practice in Rapid Sand Filtration. S. W. Farrington. Inst. Mun. & Co. Engrs. June 12, '28. Elements of Successful Water Filtration. H. N. Jenks. (Paper read before Iowa W. W. Conference.) Can. Engr. June 19, '28. Chemical Handling and Control of the Baltimore Filters.\* James W. Armstrong. Eng. N. R. July 12, '28. Gutachten über Frischwasserhauptskläranlagen System Oms. (Opinion on the Oms System of House Clarification for Fresh Water.) Ph. Kuhn. Gesund. Ing. May 19, '28. Ein KleinfILTER zur Wasserenthartung. (A Small Filter for Softening Water.) E. Quitmann. Gesund. Ing. May 26, '28. Fortschritte in der Praxis der Wasserenthartung.\* (Advances in Water Softening Practice.) Haller. Tech. Gemein. June 20, '28. Bemerkenswertes Vorkommen von lebenden Organismen in Wasserröhren.\* (Noteworthy Occurrence of Living Organisms in Water Pipes.) R. Kolwitz. Gas und Wasser. Mar. 24, '28. Ueber Eisen und Mangan im Wasser.\* (On Iron and Manganese in Water.) Heinrich Thiele. Gas und Wasser. Mar. 31, '28. Ueber die Chlorierung von Wasser. (On the Chlorination of Water.) L. W. Haase. Gas und Wasser. Apr. 28, '28. Die physikalisch-chemischen Vorgänge bei der Entmanganung von Trinkwasser.\* (The Physico-Chemical Processes in the Removal of Manganese from Drinking Water.) J. Tillmans and others. Gas und Wasser. Serial beginning May 26, '28.

## e. Distribution of Water

Pumping Station Practice.\* F. W. Dean. N. E. W. W. Assoc. June, '28.  
 Constructing Tallassee Conduit.\* Public W. June, '28.  
 Parleys-Sunnyside Water Supply Conduit, Salt Lake City.\* Harry C. Jessen. West. Constr. N. June 10, '28.  
 New Soft Water Supply for Santa Maria, California. Harry L. Neel, Jr. West. Constr. N. June 10, '28.  
 Sand-Control Works at Fort Laramie Canal Intake.\* Ivan E. Houk. Eng. N. R. June 14, '28.  
 Operation of the Hydraulic Ram.\* J. A. MacDonald. Can. Engr. June 19, '28.  
 Extension and Operation of Water Distribution System of Springfield, Mass.\* Eng. N. R. June 28, '28.  
 The Columbia Basin Project.\* Ivan C. Crawford. Mil. Engr. July-Aug., '28.  
 Le Tracé des Coudees Coniques des Conduites en Tôle Rivée.\* (Drawing Conical Bends for Riveted Sheet Conduits.) N. Dewulf. Gen. Civ. Serial beginning June 16, '28.  
 Reinigung einer 52 Jahre alten, 350 mm. l. w. und 20 km. langen Gefällestleitung.\* (Cleaning a 52-Year-Old Conduit 350 mm. Inside Diameter and 20 km. Long.) R. Schwarzbach. Gas und Wasser. May 5, '28.  
 Sicherheitsmaßnahmen im Maschinenbetriebe von Wasserwerken.\* (Safety Precautions in Machinery Operation in Water Works.) Fr. Ihlefeld. Gas und Wasser. Apr. 14, '28.

## x. Miscellaneous

An Accounting System Which is Simple. G. W. Paulette. (Paper read before Kansas W. W. Assoc.) Mun. N. May, '28.

## J. Sewerage. Sewage and Refuse Disposal

## a. Sewers and Drains

Flushing Sewers.\* F. Johnstone Taylor. Comwith. Engr. May, '28.  
 St. Louis Reconditions Old Sewers With Gunite.\* E. Paffrath. Eng. N. R. June 14, '28.

## b. Sewage Disposal, Purification

Financing the Operation of Sewage Treatment Plants. F. H. Waring. (Paper read before Ohio Conference on Sewage Treatment.) Mun. N. May, '28.  
 Sewage Treatment at Montezuma School, Los Gatos.\* Clyde C. Kennedy. West. Constr. N. June 10, '28.  
 Sewage Treatment Plant for San Bernardino, California.\* F. S. Currie. West. Constr. N. June 10, '28.  
 Sewage Treatment Plant Odor Nuisance. Linn H. Enslow. (Paper read before North Carolina Conference on Water Purification and Sewage Treatment.) Can. Engr. June 12, '28.  
 Automatic Hydro-Electric Control at Baltimore Sewage-Works.\* C. E. Keefer. Eng. N. R. June 14, '28.  
 Kitchener Sewage Disposal Problem. Can. Engr. June 19, '28.  
 The Design of Small Sewage Treatment Works at Gaithersburg, Md.\* Harry R. Hall. W. W. June, '28.  
 Sewage Disposal Plant Construction at Fond du Lac, Wisconsin. L. R. Howson. W. W. June, '28.  
 The Design of Settling Basins for Sewage Treatment Plants.\* Karl Imhoff. W. W. June, '28.  
 The Design of Settling Basins for Sewage Treatment Plants.\* Karl Imhoff. Mun. N. June, '28.  
 Refuse Disposal in Great Britain. H. W. Streeter. (From Bulletin U. S. Public Health Service.) Mun. N. June, '28.  
 The Design of Small Sewage Treatment Works at Gaithersburg, Md.\* Harry R. Hall. Mun. N. June, '28.  
 Novel Sewage Treatment Methods in Small Plant.\* Public W. June, '28.  
 Report on New York's Sewage Disposal. Public W. June, '28.  
 Schenectady Sewage Plant Operation. Public W. June, '28.  
 Die Abwasserbehandlung von Groningen.\* (Sewage Treatment at Groningen.) H. Blunk. Gesund. Ing. June 9, '28.  
 Sewage Agitation and Chlorination Tests at Havre, Mont. Emil Sandquist and H. B. Foote. Eng. N. R. June 28, '28.  
 Sewage Treatment Abroad. William Rudolfs. Pub. W. Serial beginning July, '28.  
 Activated Sludge Disposal Plants at Charlotte, N. C.\* E. G. McConnell. Pub. W. July, '28.  
 Financing Sewage Treatment Operation in Ohio. F. H. Waring. (Paper read before Ohio Conference on Sewage Treatment.) Pub. W. July, '28.  
 Sewage-Works Construction at Cleveland, Ohio.\* A. A. Burger. Eng. N. R. July 12, '28.  
 Untersuchungen über das Wesen des Belebtschammverfahrens.\* (Investigations on the Character of the Activated Sludge Method.) Adolf Seiser. Gesund. Ing. Serial beginning Apr. 21, '28.  
 Die Reinigung der Abwasser von Paris.\* (Purifying the Sewage from Paris.) Wilh. J. Müller. Gesund. Ing. May 26, '28.

## K. Heat Engines

## a. Steam Engines, Boilers

The First Commercial 1 200-Pound Steam Plant in the World.\* Irving E. Moulthrop. Eng. Inst. Can. June, '28.

## b. Steam Turbines

Lawaczeck Turbines at Lilla Edet, Sweden.\* George Willock. Can. Engr. June 12, '28.

## c. Gas and Oil Engines

Panama Canal Diesel Station at Miraflores.\* L. W. Lewis. *Mil. Engr.* July-Aug., '28.

## L. Electricity

## b. Distribution and Transmission of Electricity

## 1. Power Plants

A New Electric Generating Station at Guildford.\* *Engr.* Serial beginning June 1, '28.

## 2. Long-Distance Transmission of Energy

Rural Electrification at Chester.\* *Engr.* June 15, '28.

## 3. Distribution and Wiring of Electricity

Lightning Investigation on New England Power Company System.\* E. W. Dillard. *A. I. E. Engr.* July, '28.

Hochspannungskabel für elektrische Kraftübertragungen.\* (High Tension Cable for Electric Power Transmission Lines.) R. Apt. *Ver. deu. Ing.* June 16, '28.

## f. Signals and Communication

The Planning of Telephone Exchange Plants.\* W. B. Stephenson. *A. I. E. Engr.* July, '28.

Electric Lighthouses in France.\* C. S. Du Riche Preller. *Eng.* July 6, '28.

Fortschritte im elektrischen Nachrichtenwesen im Jahre 1927 in Deutschland.\* German Advances in Electrical Communication in 1927.) Karl Willy Wagner. *Ver. deu. Ing.* June 2, '28.

## M. Architecture

## b. Business and Commercial Buildings

Interesting Features in Design of *Chicago Daily News Building*.\* *Eng. & Contr.* June, '28.

Open-Web Floor Joist Construction in 42-Story Building.\* *Eng. N. R.* July 12, '28.

Wettbewerb Bauausstellung und Berliner Ausstellungsplane.\* (Competition for a Building

Exposition and Berlin Exposition Plans.) Gustav Lampmann. *Z. d. Bauver.* May 30, '28.

## c. Residences, Hotels

Wohnhausbauten in Palästina.\* (Dwelling Construction in Palestine.) A. Baerwald. *Z. d. Bauver.* May 23, '28.

## d. Storage Buildings

New Grain Elevator at Sarnia, Ontario.\* W. B. Beatty. *Can. Engr.* June 26, '28.

## O. Administration. Legislation. Economics. Statistics

## c. Statistics of General Interest

Les Index Economiques. Leur Application aux Concessions de Services Publics.\* (The Economic Index Numbers. Their Application to Public Service Concessions.) René Roy. *Ann. P. et C. Mar.*, '28.

## d. Administrative and Financial Management of Means of Communication

## 2. Routes and Roads

Highway Construction Cost Keeping. W. H. Brown. (Paper read before Ontario Road Builders Assoc.) *Can. Engr.* July 3, '28.

## 5. Railroads and Street Railways

Determining the Labor Cost of Tracklaying and Surfacing.\* H. E. Hale. *Ry. Age* June 16, '28.

## g. Engineering Education

Educating Engineers in Economics. W. E. Wickenden. (From paper read before Industrial Conference in Penn. State College.) *Eng. N. R.* June 14, '28.

## P. Geology

Report on the Geology of St. Francis Damsite, Los Angeles County, California.\* Bailey Willis. *West. Constr. N.* June 25, '28.

## Q. Surveying and Geodesy

Quantity Surveying and the Architect. G. Szmak. *Eng. & Contr.* July, '28.

## S. City Planning

Badly Needed Drives Built on Made Land in New Park Project.\* *Mun. N.* May, '28.

Development of Housing Areas in Dublin. P. E. Mathews. *Inst. Mun. & Co. Engrs.* June 12, '28.

Saskatchewan Town Planning. A. G. Dalzell. *Can. Engr.* June 19.

Planning Procedure in Smaller Cities. Jacob L. Crane. (Paper read before Nat'l Conference on City Planning.) *Can. Engr.* July 10, '28.

Methods used in Making New Land and Boulevards on Chicago Waterfront.\* *Eng. & Contr.* Serial beginning July, '28.

## Employment Service

The Engineering Societies Employment Service is under the joint management of the National Societies of Civil, Mining, Mechanical, and Electrical Engineers. A Chicago office is maintained in co-operation with the Western Society of Engineers, and a San Francisco office, in co-operation with the Engineers' Club of San Francisco and the California Section of the American Chemical Society. The Service is available only to the several memberships and is maintained by contributions from the Societies and their individual members who are directly benefited.

*Officers.*—Eastern Office, 31 West 39th Street, New York, N. Y., Walter V. Brown, Manager; Chicago Office, 205 West Wacker Drive, 1216 Engineering Building, Chicago, Ill., A. Krauser, Manager; and San Francisco Office, 57 Post Street, Room 715, San Francisco, Calif., Newton D. Cook, Manager.

*Men Available.*—Under this heading, brief announcements will be published without charge. These announcements will not be repeated, except on request received after an interval of one month. Names and records will remain in the active files of the Service for a period of three months, and are renewable on request. Notices for *Proceedings* should be addressed to Employment Service, 31 West 39th Street, New York, N. Y., and should be received prior to the first of the month.

*Opportunities.*—A Bulletin of engineering positions available is published weekly and may be obtained by members of the Societies concerned at a subscription rate of \$3 per quarter, or \$10 per annum, payable in advance. Positions which are not filled promptly as a result of publication in the Bulletin, may be announced herein.

*Voluntary Contributions.*—Members obtaining positions through the medium of this Service are invited to co-operate with the Societies in the financing of the work by nominal contributions made within thirty days after placement, on the basis of 1½% of yearly salary; temporary positions (of one month or less), 3% of total salary received. The income contributed by the members, together with the finances appropriated by the four Societies named, will be sufficient, it is hoped, not only to maintain but to increase and extend the Service.

*Replies to Announcements.*—Replies to announcements published herein, or in the Bulletin, should be addressed to the key number indicated in each case, with a two-cent stamp attached for re-forwarding, and forwarded to the Employment Service at the address given. Replies received by the Service after the positions to which they refer have been filled, will not be forwarded.

### MEN AVAILABLE

RESIDENT ENGINEER, M. Am. Soc. C. E.; M. Am. Ry. Eng. Assoc.; age 57. Registered civil engineer. Registered architect. Long-time experience in office management and purchasing. Location, South preferred. A-1602.

electric, domestic supply, irrigation, hydraulics generally. Examinations, estimates, bids, appraisals, reports. Foreign experience, Peru, Mexico, Santo Domingo, Sicily, Greece. A-2848.

CONSULTING ENGINEER, Assoc. M. Am. Soc. C. E.; age 61; married. Expert on design and construction, dams, masonry of all kinds, aqueducts, pipe lines; hydro-

CIVIL ENGINEER, M. Am. Soc. C. E.; single. About 15 years on water supply construction, maintenance, and operation; also, hydro-electric construction, preferring water from the dam up; also, about 15

years' experience along the lines of city engineer with highway and railroad location, construction, and maintenance. Speaks Spanish, will go to Latin America or the Far East. A-5380.

**CIVIL AND HYDRAULIC ENGINEER**, M. Am. Soc. C. E.; college degree. Sixteen years' experience in investigation, design, and construction of earth dams for power and domestic water supply. Investigation of run-off and dam sites. Design and construction of dams and controlling works. Desires position with hydro-electric or development company. B-120.

**STRUCTURAL ENGINEER**, Assoc. M. Am. Soc. C. E.; age 34; married. M. I. T. Graduate, M. S. in C. E. Ten years' experience, designing, estimating, and constructing concrete and steel structures of all types; perfect knowledge of Russian and French; American citizen; desires responsible executive position requiring technical ability and experience. New York City or Europe preferred. B-1168.

**CIVIL AND SANITARY ENGINEER**, M. Am. Soc. C. E.; married. Extensive experience, engineering design and construction; railroads, street railways, irrigation, highways, harbor improvements, sewerage, sewage disposal, water supply, hydro-electric developments. Employed in various capacities, from draftsman to chief engineer, projects costing \$500 000 to \$20 000 000. Good knowledge of Spanish, Atlantic, Pacific Coast, Spanish-speaking countries preferred. B-1550.

**CONTRACTOR'S REPRESENTATIVE**, Assoc. M. Am. Soc. C. E.; age 40; graduate. Seventeen years' experience, building and general construction, including estimating, construction, and valuation. Desires new connection. Now employed. Minimum salary, \$5 000. Location desired, New York City, or Philadelphia, Pa. B-2775.

**PROFESSOR OF CIVIL ENGINEERING**, Assoc. M. Am. Soc. C. E., with C. E. and M. S. degrees. Twelve years' practical experience in highway, railway, drainage, irrigation, topographic and hydrographic surveys, design, reports, estimates, etc.

ten years, drainage, irrigation, and civil engineering drawing. At present with State College. B-3519.

**OFFICE ENGINEER**, Assoc. M. Am. Soc. C. E.; age 47; single; specializing in investigations, valuations, reports of engineering and building construction; four years, drafting; six years, resident engineer in field; two years, valuation; four years, estimating; two years, Captain, U. S. Engineers; seven years, office engineer. Available in September. Location, New York City or vicinity. B-5455.

**CIVIL ENGINEER**, M. Am. Soc. C. E. Twenty-five years' experience on hydroelectric, irrigation, and highway work and in exploration. Intimately acquainted with conditions in Central America and the West Indies. Prepared to make investigations and reports or superintend construction or operation of Latin-American projects. B-7788.

**ASSISTANT PROFESSOR**, Assoc. M. Am. Soc. C. E.; age 40; married. Practical experience in design and construction of steel and concrete bridges and buildings. Four years' experience, teaching mechanics and structural engineering. Location, North Atlantic Seabord preferred. B-8524.

**CIVIL ENGINEER**, Jun. Am. Soc. C. E.; age 29; single; an oriental; college graduate. Two years' experience in waterworks, surveying, and construction. Best references. Desires connection with concern operating in the Far East. C-1804.

**CIVIL ENGINEER**, Jun. Am. Soc. C. E.; age 27; single; college graduate. Five years' experience in field and office, part of this time in responsible position in Japan. Desires position with concern operating in the Far East. Excellent references. C-3736.

**RECENT GRADUATE**, age 25; University of Utah, 1928. Technical training at the University consisted of: Surveying, reinforced concrete design, highway study, steel detail, and hydraulic work. Some experience in topographical surveying and road work. C-4381.

RECENT GRADUATE, age 25; University of Utah, 1928. Technical training at the University consisted of: Surveying, reinforced concrete design, highway study, steel detail, and hydraulic work. Some experience in topographical surveying and road work. C-4381.

RECENT GRADUATE, age 25; University of Utah, 1928. Technical training at the University consisted of: Surveying, reinforced concrete design, highway study, steel detail, and hydraulic work. Some experience in topographical surveying and road work. C-4381.

RECENT GRADUATE, age 25; University of Utah, 1928. Technical training at the University consisted of: Surveying, reinforced concrete design, highway study, steel detail, and hydraulic work. Some experience in topographical surveying and road work. C-4381.

## Membership

(From July 4 to August 7, 1928)

### Additions

#### MEMBERS

	Date of Membership.
ALLEN, Chester Lawrence. Prof., Civ. Eng., and Head of Dept., Michigan State Coll. (Res., 407 Grove St.), East Lansing, Mich.	Assoc. M. June 1, 1925 M. July 16, 1928
ALLEN, Raymond Cleaveland. Civ. Engr., Box 67, Manchester, Mass.	Assoc. M. Dec. 6, 1910 M. July 16, 1928
ALLMAN, Sydney Kayser, Jr. Asst. Engr., Golder Constr. Co., 1600 Arch St., Philadelphia, Pa.	Jun. July 16, 1928
AVERS, Henry Godfrey. Chf. Mathematician, Div. of Geodesy, U. S. Coast & Geodetic Survey, Washington, D. C.	Assoc. M. July 16, 1928
BACON, Sumner Davis. Res. Engr., State Highway Dept., Box 422, Childress, Tex.	Assoc. M. July 16, 1928
BARTON, George Henry. Care, R. W. Hebard & Co., Agencia Carreteras al Mar, Cartagena, Colombia.	Jun. Jan. 16, 1928
BECKMAN, Henry Claus. Dist. Engr., U. S. Geological Survey, Box 138, Rolla, Mo.	Assoc. M. Mar. 9, 1920 M. July 16, 1928
BERRYMAN, Russell Gardner. Transit Engr., Dept. of City Transit (Res., 6431 North 17th St.), Philadelphia, Pa.	Assoc. M. July 16, 1928
BICKLEY, Glen Copley. Aitkin, Minn.	Assoc. M. July 16, 1928
BINGER, Walter David. Pres. and Treas., Thompson & Binger, Inc., 108 Park Ave., New York, N. Y.	Jun. May 15, 1917 Assoc. M. June 1, 1920 M. July 16, 1928
BISCHOF, George Paul. Asst. Engr., Oakdale Contr. Co., Inc., New York (Res., 471 Ocean Parkway, Brooklyn), N. Y.	Assoc. M. July 16, 1928
BLACKWOOD, Edwin Neale. Res. Engr., Div. 1, State Road Comm., Clay, W. Va.	Jun. July 16, 1928
BOGARDUS, Theodore S. Asst. City Engr., City Hall, Meadville, Pa.	Jun. July 16, 1928
BOYD, Jacob Murphree. County Engr., Palm Beach County, Box 3636, West Palm Beach, Fla.	Jun. June 4, 1928
BONI, Ovidio Augustus. Chf. Draftsman, Atlantic Gulf & Pacific Co. of Manila, 77 Muelle de la Industria, Manila, Philippine Islands.	Assoc. M. July 16, 1928
BRATTLOF, Clifford. 354 Seventy-fifth St., Brooklyn, N. Y.	Assoc. M. April 23, 1923
BREEDEN, Allison Boone. Senior Res. Engr., State Highway Dept., Camden, Tenn.	Jun. July 16, 1928
BRIELMAYER, Alphonse Anthony. 1248 East 124th St., Cleveland, Ohio.	Assoc. M. July 16, 1928
BRUCKER, Frederick Emmanuel. Designer and Draftsman, Maurice A. Reidy (Res., 6 Ulmer St.), Boston, Mass.	Jun. July 16, 1928
BUCHANAN, William Franklin. County Engr., Middlesex County Borough Engr. of Metuchen (Res., 76 Clive St.), Metuchen, N. J.	Jun. July 16, 1928
BUERMANN, Arthur William. Newark Athletic Club, Newark, N. J.	Assoc. M. July 16, 1928
BURDETTE, Charles Roland. Chf. Designer and Associate to Herman F. Doeelman (Res., 516 North Charles St.), Baltimore, Md.	Jun. July 16, 1928
CARPENTER, Carl Bradford. City Engr. (Res., 408 East 6th St.), Bloomington, Ind.	Jun. July 16, 1928
CARTER, Harry Vern. Mgr., Structural Dept., Braden Steel & Winch Co. (Res., 2526 East 7th St.), Tulsa, Okla.	Assoc. M. July 16, 1928
CHRISTENSEN, Aage Broager. Office Engr., Ulen & Co., 27 Philhellenes St., Athens, Greece.	Assoc. M. June 4, 1928
CLARK, Eldon Saunders. Asst. Engr., Metcalf & Eddy, 1300 Statler Bldg. (Res., 23 Beaumont St.), Boston, Mass.	M. July 16, 1928
COHEN, Lewis Julius. Engr., U. A. Young, Narberth (Res., 1015 Chestnut St., Philadelphia), Pa.	Jun. June 4, 1928
CRENSHAW, Allen Ehlers. Civ. Engr., Alameda County (Res., 178 Moss Ave.), Oakland, Calif.	Jun. June 4, 1928
CROWELL, Sidney Howe. Junior Engr., U. S. Bureau of Standards (Res., 3804 Jenifer St., N. W.), Washington, D. C.	Jun. June 4, 1928
DAVIDSON, David Lomas. Pres., Town Planning Assoc. of New South Wales; Engr., Met. Board of Water, Sewerage and Drainage, 341 Pitt St., Sydney, N. S. W., Australia.	Assoc. M. Jan. 16, 1928
DECK, Frederick Webster. Designer; Supervisor, Office Branch, Steel Tower Section, Philadelphia Elec. Co., Philadelphia (Res., 60 Nyack Ave., Lansdowne), Pa.	Assoc. M. July 16, 1928
DOBROWOLSKI, John Theodore. 153 East 2d St., New York, N. Y.	Jun. Jan. 16, 1928
DOHERTY, William Edward Aloysius. Engr. of Constr., Bureau of Highways, 232 City Hall (Res., 1807 South 65th St.), Philadelphia, Pa.	Assoc. M. June 4, 1928

## MEMBERS—(Continued)

Date of  
Membership.

DONOGHUE, George Terry. Supt., South Park System, 57th St. and Cottage Grove Ave., Chicago, Ill.	M.	July 16, 1928
DOYNE, Max Harry. Chf. Engr. and Mgr., C. E. Smith & Co., 2095 Railway Exchange Bldg., St. Louis, Mo.	Jun.	Jan. 19, 1920
DRABKIN, Abraham Leonard. Structural Engr., Albert Kahn, Inc., 1000 Marquette Bldg., Detroit, Mich.	Assoc. M.	June 6, 1921
DROWNE, Henry Bernardin. Div. Engr., The Lane Constr. Corporation, 40 Converse St., Longmeadow, Mass.	M.	July 16, 1928
DUNN, Thomas Grover. County Supt. of Highways, Gorham, Ill.	Assoc. M.	July 16, 1928
EBLING, Everett Ernest. 6810½ Lowe Ave., Chicago, Ill.	Assoc. M.	July 16, 1928
EVANS, Arthur Wyndham. Sewer Engr., City of Wilkes-Barre (Res., 102 Waller St.), Wilkes-Barre, Pa.	Assoc. M.	July 16, 1928
FAHY, Frank Edward. Care, Holabird & Root, 333 North Michigan Ave., Chicago, Ill.	Jun.	July 16, 1928
FAIR, Gordon Maskew. Asst. Prof., San. Eng., Harvard Univ., 112 Pierce Hall, Harvard Univ., Cambridge, Mass.	Assoc. M.	Mar. 15, 1926
FELPS, Clemens Inks. Engr. of Constr., State Highway Comm., 121 Courtland, Topeka, Kans.	M.	July 16, 1928
FISCHER, Hugo Carl. Lt. Commander, C. E. C., U. S. N., Bureau of Yards and Docks, Navy Dept., Washington, D. C.	M.	Mar. 5, 1928
FOOTE, Francis Chandler. Senior Asst. Engr., Morris Knowles, Inc., 507 Westinghouse Bldg., Pittsburgh, Pa.	Assoc. M.	July 16, 1928
FOX, Robert Lee. City Engr.; Engr., City Planning Comm., Bethlehem, Pa.	M.	July 16, 1928
FULKMAN, John Alexander. Hydr. Engr., Consoer, Older & Quinlan, Inc., 205 West Wacker Drive, Room 1700, Chicago, Ill.	Assoc. M.	June 16, 1919
GALT, Albert Carpenter. In Chg., Southern Office, Van Trump Testing Laboratory, 219 Terminal Warehouse Bldg., Little Rock, Ark.	M.	July 16, 1928
GARMEZY, Samuel. Chf. Designing Engr., Atlantic Gulf & Pacific Co., Box 262, Manila, Philippine Islands.	Assoc. M.	May 8, 1922
GERRISH, Herbert Thurston. Treas. and Gen. Mgr., Gerrish Dredging Co.; Treas. and Gen. Mgr., Trimont Dredging Co., 10 State St., Boston, Mass.	M.	April 23, 1928
GIRAUD, Charles Frank. Pres., Chas. F. Giraud & Jas. M. Welsch, Inc., 470 East Tremont Ave. (Res., 4293 Vlaco Ave.), New York, N. Y.	Assoc. M.	Oct. 14, 1919
GIVAN, Albert. Gen. Mgr. and Chf. Engr., Sacramento Municipal Utility Dist. (Res., 2175 Thirty-fifth St.), Sacramento, Calif.	M.	July 16, 1928
GORDON, Alfred. Engr., Bridge Dept., C. P. Ry., 401 Windsor St. Station, Montreal, Que., Canada.	Assoc. M.	July 16, 1928
GREEN, Edward Hart, Jr. Asst. to Supt., Edison Portland Cement Co., New Village, N. J. (Res., 340 Spring Garden St., Easton, Pa.).	M.	July 16, 1928
GRIME, Leonard. Structural Draftsman, Am. Bridge Co., 1219 Utah St., Toledo, Ohio.	Jun.	July 16, 1928
HAAGER, Clyde Edward. 234 North Grant St., Wooster, Ohio.	Jun.	July 16, 1928
HALL, Harry Rutledge. Deputy Chf. Engr., Washington Suburban San. Dist., Hyattsville, Md.	Assoc. M.	Dec. 3, 1912
HARROP, Edgar. Asst. Engr., McClintic-Marshall Co., 130 Fourth Ave., Phoenixville, Pa.	M.	July 16, 1928
HAZELET, Craig Potter. Chf. Engr., The Scherzer Rolling Lift Bridge Co., 53 West Jackson Boulevard, Chicago, Ill.	Assoc. M.	July 16, 1928
HIRSCHTHAL, Meyer. Concrete Engr., D. L. & W. R. R., Hoboken, N. J.	M.	July 16, 1928
HOLCOMB, Glenn Willis. Asst. Prof., Civ. Eng., Oregon State Agri. Coll. (Res., 762 Jefferson St.), Corvallis, Ore.	Assoc. M.	July 16, 1928
HOPFE, Elmer Robert. 1734 West 103d St., Chicago, Ill.	Jun.	Mar. 5, 1928
HORTON, Freeman Hudson. With Cincinnati Union Terminal Co., 1020 Temple Bar Bldg., Cincinnati, Ohio.	Assoc. M.	July 16, 1928
HOVEY, Otis Wadsworth. Asst. Designing Engr., Dept. of Public Works, City-County Bldg. (Res., 282 Bellevue Ave.), Pittsburgh, Pa.	Assoc. M.	June 4, 1928
HOWE, John Edward. Care, Staff House, Temiskaming, Que., Canada.	Jun.	Jan. 16, 1928
HOY, William Wilson. Cons. Engr., 516 National Bank Bldg., Santa Ana, Calif.	M.	April 23, 1928
HSU, Kuan-San. Senior Asst. Engr. and Chf. of Planning Div., Dept. of Public Works, Municipality of Greater Shanghai (Res., V261 A Yates Rd.), Shanghai, China.	Jun.	July 6, 1925
JARMAN, Junius Thomas. Junior Cartographic Engr., U. S. Coast and Geodetic Survey, 2138 California St., N. W., Washington, D. C.	Assoc. M.	June 4, 1928
JARRETT, James Maurice. Supt. of Water Works, Southern Pines, Box 1602, Southern Pines, N. C.	Jun.	July 16, 1928

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		Date of Membership.
JONGE, Albert Edward Richard de.	509 West 110th St., Apartment 5-D, New York, N. Y.	Assoc. M. Mar. 15, 1926 M. July 16, 1928
KELLY, Ira David Sankey.	With State Highway Dept., 252 West Water St., Pinckneyville, Ill.	Jun. July 16, 1928
KELLY, Ironton Austin, III.	Chf. Engr. and Gen. Mgr., H. S. Stevens Co., Inc., 1 Union Square, Rye, N. Y.	Jun. July 16, 1928
KING, Oliver Linton.	Asst. Engr., Abington Township, 137 North Keswick Ave., Glenside, Pa.	Assoc. M. July 16, 1928
KNIGHT, Elmer Russell.	Asst. Highway Engr., Grade II, State Div. of Highways, Carbondale, Ill.	Assoc. M. July 16, 1928
KNUDSEN, Esther Marie.	Draftsman, State Highway Comm. (Res., 226 West Gilman St.), Madison, Wis.	Jun. July 16, 1928
KRATZ, Francis Horton.	7248 Glenthorne Rd., Stonehurst Hills, Pa.	Jun. July 16, 1928
KRICK, Daniel High.	Apprentice, Western Stevedoring Co.; 430 Meadowbrook Rd., St. Davids, Pa.	Jun. July 16, 1928
KULAS, Frank August.	Junior Engr., The San, Dist. of Chicago, 910 South Michigan Boulevard, Chicago, Ill.	Jun. June 4, 1928
LAMB, Gilbert Baldwin.	Eng. Asst., New York Telephone Co. (Res., 574 West End Ave.), New York, N. Y.	Jun. July 16, 1928
LANGE, George John Franklin.	73 Quitman St., Newark, N. J.	Jun. July 16, 1928
LESER, Henry.	With The Brooklyn City R. R., 168 Montague St., Brooklyn (Res., 500 West 144th St., New York), N. Y.	Assoc. M. July 9, 1912 M. July 16, 1928
LEWIS, Carlton Hyler.	Instrumentman, State Highway Comm., Albia, Iowa.	Jun. July 16, 1928
LILIENTHAL, Samuel.	Structural Engr. (Oman & Lilienthal), (Res., 3548 Reta Ave.), Chicago, Ill.	Assoc. M. Mar. 5, 1928
LOCKHART, Oliver Clifton.	Associate Highway Bridge Engr., U. S. Bureau of Public Roads, 403 Kiesel Bldg., Ogden, Utah	Assoc. M. July 6, 1925 M. July 16, 1928
LUCAS, John.	Asst. to Chf. Engr., Sinclair Refining Co., New York (Res., 256-01 Pembroke Ave., Little Neck), N. Y.	Assoc. M. July 16, 1928
MACLEISH, Gordon Grant.	Box 77, Carmel-by-the-Sea, Calif.	Assoc. M. June 4, 1928
MCCLAIN, Charles Warner.	Dist. Engr., State Highway Comm., Box 70, Seymour, Ind.	Assoc. M. July 16, 1928
MCDONNELL, Porter Wilson.	Senior Engr., Div. of Eng., City of Toledo (Res., 2 Charlevoix Court), Toledo, Ohio.	Jun. June 4, 1928
MCNICHOLAS, Richard.	Field and Office Engr., Kenneth Markwell (Res., 591 North Trezevant St.), Memphis, Tenn.	Jun. July 16, 1928
MARCH, George Miles.	Municipal Contr. (Floyd, Shofner & Co.), Springfield, Ill. (Res., 941 Kentucky St., Lawrence, Kans.).	Assoc. M. May 7, 1913 M. July 16, 1928
MARR, John Gentle.	Res. Engr., Hurt & Bartholomew, 102 Roanoke Ave., Peoria, Ill.	Jun. July 16, 1928
MIDDLESWART, Thomas C.	Dist. Engr., State Dept. of Public Works, Bridgeport, Nebr.	Assoc. M. Jan. 16, 1928
MOLINEAUX, Charles Borromeo.	Engr., The Arthur A. Johnson Corporation; 1212-A Greene Ave., Brooklyn, N. Y.	Assoc. M. July 16, 1928
MOREHOUSE, Wallace Wilber.	Director, Dept. of Water and Sewers, Room 308, U. B. Annex (Res., 31 East Norman Ave.), Dayton, Ohio.	Assoc. M. Nov. 15, 1926 M. July 16, 1928
NICOL, Herbert Erskine.	Chf. Office Engr., Sewerage Comm. City of Milwaukee, 508 Market St. (Res., 505 Newton Ave.), Milwaukee, Wis.	Assoc. M. May 8, 1922 M. July 16, 1928
NIEDERMAN, Philip Henry.	Secy., Universal Constr. Co., 915 Juneau Ave., Milwaukee, Wis.	Jun. July 16, 1928
NONES, Adolfo.	Civ. Engr., Box 284, Ponce, Porto Rico.	M. June 4, 1928
NORTHART, Paul Raymond.	Engr. (Res., 463 Hiland Rd., West View), Pittsburgh, Pa.	Assoc. M. June 4, 1928
NORTON, Albert Colwell.	Service Engr., California Corrugated Culvert Co., 5th and Parker St., West Berkeley (Res., 1660 Tacoma Ave., Berkeley), Calif.	Assoc. M. Sept. 12, 1916 M. July 16, 1928
ODESSY, Herman Paul.	Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Box 2512, San Francisco, Calif.	Jun. May 8, 1922 Assoc. M. July 16, 1928
PENDLETON, Julian Brewster.	60 New Bond St., Worcester, Mass.	Jun. July 16, 1928
PETERSON, Lawrence Eugene.	Secy. and Treas., Osthoff-Peterson Co., Inc., 110 East Wisconsin Ave., Milwaukee, Wis.	Assoc. M. July 16, 1928
PHELAN, James Joseph.	Timekeeper, Union Paving Co., 123 South 21st St. (Res., 6484 Woodcrest Ave., Overbrook), Philadelphia, Pa.	Jun. July 16, 1928
POWELL, Ralph Waterbury.	Asst. Prof. of Mechanics, Ohio State Univ. (Res., 135 West Norwich Ave.), Columbus, Ohio.	Assoc. M. July 16, 1928
ROBERTS, Leo Bond.	Supt. of Constr., J. C. Nichols Companies, 7548 Main St., Kansas City, Mo.	Assoc. M. Nov. 27, 1917 M. July 16, 1928
RUSSELL, John Manning.	Big. Constr. Engr., Bureau of Bldgs., City Hall (Res., 2500 Ellmont Ave.), Baltimore, Md.	Assoc. M. July 11, 1921 M. July 16, 1928
RUSTAN, Arvid, Konrad.	Constr. Engr., Betz Bros., Inc. (Res., 33 Lincoln St.), Passaic, N. J.	Jun. July 16, 1928

## MEMBERS—(Continued)

		Date of Membership
SADLER, Carl Leon. Topographical Engr., U. S. Geological Survey, Washington, D. C.	Assoc. M.	April 1, 1908
SCHLEGEL, Glenn Marcus. Designer, McClintic-Marshall Co., Oliver Bldg. (Res., 123 North Negley Ave.), Pittsburgh, Pa.	M.	July 16, 1928
SCHROEDL, Othello Henry. Asst. Office Engr., The J. E. Greiner Co., Lexington Bldg. (Res., 3607 Cedardale Rd.), Baltimore, Md.	Jun.	July 16, 1928
SHAND, Ninham. With Port Elizabeth Water Works, City Hall, Port Elizabeth, Cape Province, South Africa	Assoc. M.	Mar. 5, 1928
SIMMONS, Harold Andrew. Care, Marc Elsditz & Son, Inc., 68 Broadway, New York, N. Y.	Jun.	Mar. 5, 1928
SLOCUM, Stephen Elmer. Cons. Engr., 244 East Montgomery Ave., Ardmore, Pa.	M.	July 16, 1928
SMITH, Fred Bernard. 5304 West Division St., Chicago, Ill.	Jun.	Mar. 5, 1928
TENNANT, David Cowan. Structural Engr., Dominion Bridge Co., Ltd., Montreal (Res., 156 Easton Ave., Montreal West), Que., Canada	M.	July 16, 1928
THOMAS, Charles Randolph, Jr. Editor, <i>Highway Engineer and Contractor</i> , 53 West Jackson Boulevard, Chicago (Res., 1214 Central St., Evanston), Ill.	Jun.	April 1, 1914
TILTON, Harold Leslie. With Vermont Dept. of Highways, 171 Main St., Montpelier, Vt.	Assoc. M.	Mar. 13, 1917
TOLBERT, Francis Marion. Eng. Dept., Tela R. R., Tela, Honduras	M.	July 16, 1928
UNKEFER, Frederick Doyle. Pres. and Treas., Unkefer Bros. Constr. Co., Inc., 1020 Bessemer Bldg., Pittsburgh, Pa.	Assoc. M.	July 16, 1928
VOORHEES, Joshua Dixon. Supt., Gen. Constr., Modern Systems Constr. & Supply Co. (Res., 2715 College Ave.), Alton, Ill.	Jun.	July 16, 1928
WAGHORNE, Albert Charles. Vice-Pres., The Palmer Steel Co., Inc., Springfield (Res., 18 Edward St., Belmont), Mass.	Assoc. M.	July 16, 1928
WARREN, Donald Rexford. Engr., The Foundation Co. (Res., 1217 Seventeenth Ave.), San Francisco, Calif.	Assoc. M.	July 16, 1928
WELLS, George Stanley. Civ. Engr. in Chg. of Constr., Burmah Oil Co., Ltd., Digboi P. O., Assam, India	Assoc. M.	April 23, 1928
WEISSMAN, Harold Everett. Care, Am. Bridge Co., Gary Plant, Gary, Ind.	Jun.	Mar. 14, 1927
WESTON, Clarence McLellan. Engr., H. S. Ferguson, 200 Fifth Ave., Room 1303, New York, N. Y.	Assoc. M.	July 16, 1928
WHITCOMB, Henry Alexander. Junior Engr., U. S. Engr. Office, New Federal Bldg., Providence, R. I.	Assoc. M.	June 1, 1920
WHITTELSEY, Charles Chauncey. Asst. Res. Engr., Ford, Bacon & Davis, Inc., 308 Colorado Springs National Bank Bldg., Colorado Springs, Colo.	M.	July 16, 1928
WILSON, Henry Harrison (Winston Bros. Co. and H. H. Wilson) Vice-Pres., Associated Gen. Contractors of America, 9 Masonic Bldg., Harrisburg, Pa.	Assoc. M.	Nov. 26, 1918
WOODS, Edwin Marechal. Transitman, State Highway Comm., Raleigh, N. C.	Jun.	July 16, 1928
		Jun. June 4, 1928

## Reinstatements

	MEMBERS	Date of Reinstatement
CAMPBELL, George Raymond.		July 16, 1928
FRANKLAND, Frederick Herston.		July 16, 1928

## ASSOCIATE MEMBERS

FRANK, Jacob	July 16, 1928
KRUG, Frank Stanley, Jr.	July 16, 1928
WARD, George Sparkman.	July 16, 1928

## Resignations

	MEMBERS	Date of Resignation
JEWEL, Warwick Riner.		July 16, 1928

## ASSOCIATE MEMBERS

ARNOLD, Frank Palmer.	July 16, 1928
BIRD, Matthew McClung.	July 16, 1928
DEWITT, Rumley	July 16, 1928
NOBLE, Clarence Warren.	July 16, 1928
RIPPEY, John Raymond.	July 16, 1928

	AFFILIATES	Date of Resignation
MORRISON, Henry Craig		July 16, 1928
	JUNIORS	
EMANS, Karl		July 16, 1928
JENSEN, Rolf Jaeger		July 16, 1928
WANG, Chih-Han		July 16, 1928

### Deaths

BAXTER, George Strong. Elected Junior, May 12, 1875; Member, May 3, 1876; died July 2, 1928.  
 BISSELL, Hezekiah. Elected Member, September 15, 1869; died June 24, 1928.  
 BURT, Henry Jackson. Elected Member, March 1, 1905; died July 28, 1928.  
 DAVIS, Robert Waite. Elected Associate Member, November 21, 1921; died November 18, 1927.  
 ELLIOTT, Howard. Elected Affiliate, June 5, 1900; died July 8, 1928.  
 MACDONALD, Charles. (*Past-President.*) Elected Member, September 15, 1869; died July 8, 1928.  
 RALSTON, John Chester. Elected Member, October 3, 1906; died July 14, 1928.  
 REEVES, Harley Edson. Elected Member, January 4, 1910; died July 28, 1928.  
 STAATS, John Henry. Elected Member, March 5, 1884; died July 6, 1928.

### Total Membership of the Society, August 7, 1928

Members .....	5 515
Associate Members.....	5 839
Corporate Members.....	11 354
Honorary Members.....	15
Juniors .....	1 755
Affiliates .....	137
Fellows .....	7
Total .....	13 268